BUILDING LAWS

—OF THE—

City of Nashville

TENNESSEE

No. 291

SOLD TO

BY

Price, 25 Cents.

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BUILDING LAWS

OF THE

City of Nashville

Tennessee

An Ordinance Providing for Fire Limits and Regulations Governing the Construction, Alteration, Equipment, Repair or Renewal of Buildings or Structures within the Corporate Limits.

1917

COMMISSION GOVERNMENT

GEO. J. TOMPKINS, Com. Fire, Sprinkling and Building Inspection
JAS. H. YEAMAN . . . . . Supervisor of Buildings
ROBT. T. MOORE . . . . . Assistant Supervisor of Buildings
CLIFF P. COCHRAN . . . . . Electrical Inspector
WM. G. REYER. . . . . Boiler and Elevator Inspector
JOHN T. MARLER . . . . . Secretary

NASHVILLE, TENN.:
PRESS OF MARSHALL & BRUCE COMPANY
1917

FOREWORD.

In consideration for the best Code of Building Laws to be had, the Commissioner sent special requests to all the building interests, the Builders' Exchange and the Real Estate Exchange, property owners and all who would like to participate in or advise along any matter that would shed light on or better the conditions and ordinances relative to a new Code. The following gentlemen very kindly tendered their services, and have made it possible to have an up-to-date Building Code by recommending the following to the Board of Commissioners for enactment into laws. They deserve the thanks of every citizen in our great and growing city.

ARCHITECTS.

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Chas. W. Schuyler, *State Fire Prevention Commissioner,*
W. L. Mitchell, *State Factory Inspector,*
The Nashville Building Exchange,
The Nashville Real Estate Exchange,
A. A. Rosetta, *Chief of Fire Department,*
And many property owners and capitalists.

Compiled by

JAS. H. YEAMAN,
Supervisor of Buildings.

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BUILDING LAWS.

PART I.

A Remedial Ordinance.

241. *This Ordinance to be Known and Cited as the Building Code.*

1. The following provisions shall constitute and be known as the Building Code, and may be cited as such and presumptively provides for all matters concerning, affecting or relating to the construction, equipment, alteration, repair or removal of buildings or any structure whatsoever erected or to be erected in the City of Nashville, Tennessee.

2. Unless existing buildings or structures are specifically mentioned, the provisions of this Code shall apply only to buildings or structures hereafter erected or altered.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

242. *Building Code a Remedial Ordinance Applying to New Buildings and Buildings to be Altered or Repaired.*—This ordinance is hereby declared to be remedial, and is to be construed liberally to secure the beneficial interests and purposes thereof.

Idem.

PART II.

Fire Limits, Plans, Approvals, Repairs, Definitions.

243. The following shall be the fire limits of the City of Nashville, Tennessee, and shall be bounded as follows: Beginning at a point on the western bank of the Cumberland River on a direct line of Wharf Avenue (if projected and intersecting with said river); thence westward on said line and Wharf Avenue and Chestnut Street to Fourth Avenue, South; thence northward on Fourth Avenue, South, to Oak Street; thence westward on Oak Street and Bass Street to Eighth Avenue, South; thence southward on Eighth Avenue, South, to Douglas Avenue; thence westward on Douglas Avenue to Tenth Avenue, South; thence southward on Tenth Avenue, South, to Law-

rence Avenue; thence westward on Lawrence Avenue to Twelfth Avenue, South; thence southward on Twelfth Avenue, South, to Linden Avenue; thence westward on Linden Avenue to Belmont Boulevard; thence northward on Belmont Boulevard to Acklen Avenue; thence westward on Acklen Avenue to Twenty-first Avenue; thence northward on Twenty-first Avenue to Capers Avenue, or Peabody Place; thence westward on Capers Avenue, or Peabody Place, to Thirty-second Avenue; thence northward on Thirty-second Avenue to West End Avenue; thence eastward on West End Avenue to Twenty-fifth Avenue; thence northward on Twenty-fifth Avenue to Cedar Street; thence eastward on Cedar Street to Eleventh Avenue; thence northward on Eleventh Avenue to Jo Johnston Avenue; thence eastward on Jo Johnston Avenue to Tenth Avenue, North; thence northward on Tenth Avenue, North, to Jefferson Street; thence eastward on Jefferson Street and the viaduct bridge approach to the Cumberland River; thence southward with the Cumberland River to the beginning point at intersection of Wharf Avenue with the Cumberland River.

Idem.

244. Beginning at a point two hundred feet north of an extended line of Main Street where it intersects with the Cumberland River; thence extending eastwardly along said line and parallel with Main Street and the North side thereof to the Gallatin Road; thence northwardly two hundred feet west of said Gallatin Road to Eastland Avenue; thence eastward two hundred feet north of Eastland Avenue to Sixteenth Street; thence two hundred feet southwardly east of Sixteenth Street to Woodland Street; thence westward along the center of Woodland Street to Thirteenth Street; thence southwardly along the center of Thirteenth Street to Fatherland Street; thence westward along the center of Fatherland Street to Tenth Street; thence southward along the center of Tenth Street to the center of Dews Street; thence with the center of Dews Street and an extended line of same to the center of Fifth Street; thence northward with the center of Fifth Street to the center of Shelby Avenue; thence with the center of Shelby Avenue and the Sparkman Street bridge viaduct to the Cumberland River; thence northward with the eastern margin of the Cumberland River to the beginning point; *provided,* however, that where there is an alley back of the street line, these boundaries of the fire district on the east side of the Cumberland River are intended to extend to the alley, except where the center of the street is made the line. And for the west side of the Cumberland River the outside

boundaries of the fire district shall be the center of the streets named as provided in Sections 243 and 246.

Board of Commissioners, Ord. 829. Approved Sept. 19, 1916.

245. These lines constitute the limits of the fire district and shall be known as the outside boundary of the Second Zone of said fire district. The remaining territory outside of the fire district and included in the corporate limits shall be known as the Third Zone.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

246. *Boundary of First Zone.*—The following lines shall constitute the boundary of the First Zone of the fire district, and shall be as follows: Beginning at the intersection of a direct line of Mulloy Street with Cumberland River; thence westward on said line and Mulloy Street to Second Avenue, South; thence southward on Second Avenue, South, to Peabody Street; thence west on Peabody Street to Lea Avenue; thence westward on Lea Avenue to Tenth Avenue, South; thence northward on Tenth Avenue, South, to an extended line of McGavock Street; thence westward with said extended line and McGavock Street to Sixteenth Avenue, South; thence northward with Sixteenth Avenue, North, to Hayes Street; thence eastward with Hayes Street to Fifteenth Avenue, North; thence southward with Fifteenth Avenue, North, to Grundy Street; thence eastward with Grundy Street and an extended line of same to Tenth Avenue, North; thence northward on Tenth Avenue, North, to Cedar Street; thence eastward on Cedar Street to Ninth Avenue, North; thence northward on Ninth Avenue, North, to Jo Johnston Avenue; thence eastward on Jo Johnston Avenue and a direct extended line of same to the Cumberland River; thence southward with the western margin of the Cumberland River to the beginning at the intersection of Mulloy Street with said Cumberland River.

Idem.

Fire Retarding Zone.

247. Within the limits of the First Zone of the fire district there shall be a zone which shall be known as the Fire Retarding Zone. This zone shall be bounded as follows:

Beginning at the intersection of an extended line of the north side of the Public Square, with the Cumberland River; thence westwardly along said line and the north side of the Public Square (covering all property fronting on said line) to Third Avenue, North; thence along Third Avenue, North, southwardly on west side of Public Square (covering all property fronting on said line) to Cedar

Street; thence westwardly on Cedar Street (covering all property fronting on both sides of said street) to Seventh Avenue, North; thence southwardly on Seventh, Avenue, North, (covering all property fronting on east side of said Avenue) to Union Street; thence westwardly on Union Street (covering all property fronting on both sides of said street) to Eighth Avenue, North; thence southwardly on Eighth Avenue, North, (covering all property fronting on the eastern side of said Avenue) to Church Street; thence westwardly on Church Street (covering all property fronting on both sides of said street) to Ninth Avenue, North; thence southwardly on Ninth Avenue, North, (covering all property on east side of Ninth Avenue, North, to Payne Street) and continuing southwardly on Ninth Avenue, North, covering all property fronting on both sides of the street to Broadway, and all property fronting on both sides of Broadway from the Nashville Terminal Company's east lines to Cumberland River; thence northwardly along the western bank of the Cumberland River to the beginning point, and all property embraced within the above described boundary lines.

Idem.

248. *Factory Zone.*—The following lines shall constitute the factory zone:

(1) Beginning at the corporate line at junction of Hancock Street and the Cumberland River; thence eastward on Hancock Street to Orleans Street; thence south on Orleans and Cowan Streets to Spring Street; thence east on Spring Street to within 250 feet of the main track of the L. & N. R. R.; thence north on a parallel line (maintaining 250 feet distance to westward) with main track of L. & N. R. R. to Mile End Avenue; thence east on Mile End Avenue to L. & N. R. R.; thence with L. & N. R. R. and the Corporate line to Cleveland Street; thence east on Cleveland Street to a point 250 feet distant from L. & N. R. R.; thence southward on a parallel line (maintaining 250 feet distance to eastward) with main track of L. & N. R. R. to Seventh Street, North; thence southward on Seventh Street, North, to Webster Street; thence westward on Webster Street and Howerton Street to Second Street, North; thence southward on Second Street, North, and Second Street, South, to Crutcher Street; thence eastward on Crutcher Street and Greenwood Street to Seventh Street; thence south on Seventh Street, South, and Tenth Street, South, to the north margin of the Cumberland River; thence with the north margin of said river to the beginning point on Hancock Street.

(2) Beginning at the Corporate line at Junction of Van Buren Street and the Cumberland River; thence westward on Van Buren Street to First Avenue, North; thence southward on First Avenue, North, to Monroe Street; thence westward on Monroe Street to Second Avenue, North; thence southward on Second Avenue, North, to Jackson Street; thence westward on Jackson Street to Eighth Avenue, North; thence southward with Eighth Avenue, North, to within 300 feet of the T. C. R. R.; thence westward and northward on a parallel line (maintaining 300 feet distance to northward and eastward) with T. C. R. R. track and following the curve thereof to the Corporate line at the corner of Twenty-first Avenue, North, and Jefferson Street; thence westward on Jefferson Street to Twenty-third Avenue, North; thence southward on Twenty-third Avenue, North, to junction of Booker Street; thence southward, westward and northward paralleling the lines of the T. C. R. R. and N., C. & St. L. Ry. (maintaining 300 feet distance therefrom) to a point on Centennial Avenue (in the former town of West Nashville); thence westward on Centennial Avenue to a point 300 feet to west of the N., C. & St. L. Ry. track; thence parallel with said N., C. & St. L. Ry. track (maintaining 300 feet distance therefrom) and the meanderings thereof to Forty-second Avenue, North; thence southward on Forty-second Avenue, North, to Minnesota Avenue; thence eastward on Minnesota Avenue to a point 300 feet beyond the track of the N., C. & St. L. Ry.; thence northward and parallel with the N., C. & St. L. Ry. (maintaining 300 feet distance therefrom) to a point intersecting with Jo Johnston Avenue; thence eastward on Jo Johnston Avenue to Twelfth Avenue, North; thence southward on Twelfth Avenue, North, to Porter Street; thence eastward on Porter Street to track of L. & N. Terminals; thence northward and parallel with track of L. & N. Terminal Company to Cedar Street; thence eastward on Cedar Street to Ninth Avenue, North; thence northward on Ninth Avenue, North, to Jo Johnston Avenue; thence eastward on Jo Johnston Avenue and Locust Street to the Cumberland River; thence northward with the western margin of said river to the beginning point at Van Buren Street.

(3) Beginning at the Corporate line at Junction of Fairfield Avenue (extended) and the Cumberland River; thence southward on Fairfield Avenue to and with the Corporate line and tracks of T. C. R. R.; thence eastward with Corporate line to Stanley Street; thence southward with Stanley Street and the Corporate line to Fillmore Street; thence eastward on Fillmore Street to Meridith Street; thence

southwestward on Meridith Street to Donelson Street; thence southward on Donelson Street to Morton Street if projected to the Corporate line; thence with said projected line and Morton Street to and enclosing the State Fair Grounds on all sides and to Raines Avenue; thence north on Raines Avenue to Fourth Avenue, South, and Humphrey Street; thence westward on Humphrey Street to Montee Street; thence southward on Montee Street to Merritt Street; thence west of Merritt Street to the line of the L. & N. R. R.; thence southward with the L. & N. R. R. to Bradford Avenue; thence westward on Bradford Avenue to Wilson Avenue; thence northward on Wilson Avenue to Wedgewood Avenue and parallel with the L. & N. R. R. track (maintaining 300 feet distance to westward) northward and northwestward to Eighth Avenue, South, and Division Street; thence westward on Division Street to Twelfth Avenue, South; thence northward on Twelfth Avenue, South, to Gleaves Street and the L. & N. Terminals; thence on said Gleaves Street to Eighth Avenue, South; thence north on Eighth Avenue, South, to a point 250 feet from north line of N., C. & St. L. Ry. track (maintaining 250 feet distance eastward) to the north boundary of the Nashville Warehouse and Elevator property at City Cemetery; thence with said property line between said cemetery and warehouse property to Fourth Avenue, South, thence southward with Fourth Avenue, South, to Chestnut Street; thence eastward with Chestnut Street to Third Avenue, South; thence southward with Third Avenue, South, and Ensley Boulevard and Factory Street to East Hill Street; thence north on East Hill Street and Fairfield Avenue (if extended) to Robertson Street; thence northastward and parallel with the T. C. R. R. track (maintaining 250 feet distance to westward) to Fillmore Street; thence westward on Fillmore Street to Decatur Street; thence northward on Decatur Street to Willow Street; thence westward on Willow Street to Wharf Avenue; thence northward with Wharf Avenue to within 200 feet of main line of T. C. R. R. on south side; thence on said 200 feet parallel line to and including the boundary lines of the old Breen Rock Quarry and northward across main line of T. C. R. R. to Cumberland River; thence eastward with south boundary of said river to the beginning point at junction of Fairfield Avenue, extended.

(4) Within the track or yard areas of the Railroad Terminal Companies and the L. & N. R. R., N., C. & St. L. Ry. and the T. C. R. R., there may be erected such switch houses, look-outs, etc., as are commonly erected and used by and for such companies. No one of said structures shall cover an area of exceeding 400 square feet or

be more than 25 feet high, and shall not be be nearer than 30 feet of any other building or structure.

(5) Such switch-houses, look-outs, etc., shall be erected in compliance with requirements of metal-clad construction.

Idem.

249. *The Office of Supervisor of Buildings.*

(1) The office of the Supervisor of Buildings is hereby created. His salary shall be $1,800 per annum, payable as provided by ordinance. He shall give bond in the sum of two thousand ($2,000.00) dollars, with surety thereof, signed by an indemnity insurance company authorized to transact business in the State of Tennessee, conditioned that said officer will faithfully discharge the duties that are now or may hereafter be imposed upon him, and all liability that may accrue by reason of his office. Said bond shall be approved by the Board of Commissioners as provided by Charter.

Board of Commissioners, Ord. 916. Approved Feb. 13, 1917.

(2) The office of Assistant Supervisor of Buildings is hereby created. His salary shall be $1,500.00 per annum, payable as provided by ordinance. He shall give bond in the sum of two thousand ($2,000.00) dollars, with surety thereof, signed by an indemnity insurance company authorized to transact business in the State of Tennessee, conditioned that said officer will faithfully discharge the duties that are now or may hereafter be imposed upon him, and all liability that may accrue by reason of his office. Said bond shall be approved by the Board of Commissioners as provided by Charter.

Board of Commissioners, Ord. 916. Approved Feb. 13, 1917.

(3) The Supervisor of Buildings and Assistant Supervisor of Buildings shall be elected by the Board of Commissioners and nominated by the Commissioner of Fire, Sprinkling and Building Inspection, and are under his supervision and control.

Board of Commissioners, Ord. 788. Approved July 13, 1916.

(4) The Supervisor of Buildings shall issue or cause to be issued all permits and notices, keeping a record of all such proceedings, and shall pass on all questions arising under this Code, and the laws and ordinances in force in the city relating to the same subject-matter, and in case of dissatisfaction because of his decision (except in respect to insecure and unsafe buildings and property requiring immediate action) the question in dispute may be referred to the Board of Appeal and a decision of a majority of the said Board shall determine the issue.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

(5) The Supervisor of Buildings shall have the authority to enter and inspect any building, structure or sign or part thereof in the City of Nashville, to condemn the same and order it, (when condemned), demolished, torn down or removed or placed in a safe condition.

Board of Commissioners, Ord. 908. Approved Jan. 30, 1917.

250. *Board of Appeals.*

(1) For that purpose there is hereby created a Board, to be known as the Board of Appeals of the Department of Building, to consist of three members; one an architect, one a structural engineer and one a builder.

(2) Each to be appointed by the Commissioner of Fire, Sprinkling and Building Inspection, with the approval of the Board of Commissioners.

(3) The members thereof are to be subject to removal by the Commissioner of Fire, Sprinkling and Building Inspection at any time, and unless removed shall serve during the term of the Commissioner appointing them and until their successors are appointed and qualified.

(4) The party taking the appeal shall have the right to challenge for sufficient cause any member of the Board, and if the Commissioner shall so determine he may appoint any other architect, structural engineer or builder to replace the one so challenged (for sufficient cause) for the case in question only.

(5) Each member shall take an oath to faithfully perform his duties under and in compliance with this ordinance and all laws and ordinances of the City of Nashville applicable hereto.

(6) The Board shall have such use of the office of the Building Inspection Department and service of inspectors, clerks and stenographers as may be required.

(7) Each member of the Board shall serve without stated compensation but shall be paid such fees as may be allowed by the Commissioner, and all necessary expenses, all of said amounts to be paid by the party appealing a question to them; *provided,* said question be decided against the party taking the appeal; but if said question be decided in favor of the party taking the appeal, all said amounts shall be paid by the city.

(8) Any party so appealing to the said Board shall at the time deposit with the city a sufficient sum to cover all such allowances and expenses, said sum to be refunded if said question be decided in favor of the party taking the appeal.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

251. *Tenants to be Notified.*

1. Whenever a building or structure has been condemned, ordered torn down, or repaired, by the Supervisor, he shall notify the tenant or tenants of such condemnation in writing, and warning the said tenant or tenants to vacate within a specified time, if necessary, or do and perform such other acts or works as may be necessary to fulfill the orders set out in the condemnation notice.

2. And should said tenant or tenants fail or refuse to promptly comply with such notices and orders they shall be deemed guilty of a misdemeanor.

Idem.

252. *Danger Cards.*—Whenever the Supervisor has knowledge of any unsafe building, structure, or part thereof, the conditions being such as to endanger the public or the occupants thereof, it shall be his duty to affix suitable notices in a conspicuous place on the exterior thereof; and any person removing such notices shall be deemed guilty of a misdemeanor.

Idem.

253. *Preliminary Requirements for Permits.*

1. No building or structure, platform or staging, sign, sign bulletin, signboard, billboard, awning, fire escape, marquise, or other structure shall be erected, unless it be in conformity to the provisions of this ordinance.

2. No building, structure or other item as herein stated (already erected) shall be raised, altered, repaired, moved or built upon in any manner that would be in violation of any of the provisions of this ordinance.

Idem.

254. 1. Any person or persons desirious of erecting, repairing, altering, or changing, in any way, any building or structure, fire escape, window or door, stairway, or other means of ingrees or egress, awning, sign, billboard, or other structure within the limits of the City of Nashville, shall first apply at the office of the Building Inspection Department for a permit to do the work desired, and shall make such written statements, and file such data, plans and specifications as are required by said department for the purpose of a clear understanding by said department that said works are, and are contemplated to comply with the ordinances relative thereto. Provided that it shall be obligatory to file plans and specifications with the

Building Inspection Department for all structures of a value exceeding $1,500.00, and the data of Kidder's Manual shall be used by the Supervisor in estimating values of such works when considered necessary. (NOTE.—*See Sec. 384.*) The plans and specifications required to be filed with the Supervisor shall be accompanied by a written certificate of the architect or engineer certifying that the general arrangement of the entire construction in all important details, including the size, length, the qualities, proportions, and the dead and live loads each floor is designed to carry are in conformity with the provisions of this Code. All such plans and specifications shall be signed by the architect, engineer, contractor or person applying for the permit. In no case shall the construction deviate from the approved plans and specifications except by written consent of the Supervisor.

2. And said department, after receiving all such statements, data, plans and specifications (copy of which shall be retained until completion of said buildings or works) shall take such time as is necessary to examine same, and if found that the said works are, and are contemplated to comply with the ordinances relative thereto may issue a permit therefor on a uniform blank as adopted and used by said department.

3. All permits shall be kept on or at the structure or works so that they may be inspected by the proper officers of the city, and such permits shall be null and void if actual work is not begun on the premises within 30 days from date of issuance.

Idem.

255. 1. The Inspection Department shall approve or disapprove statements, plans and specifications, and condemn structures and works upon the conditions and demands of these ordinances alone.

2. If the Inspection Department find that the structure or works are being erected or done in violation of these ordinances, the permit shall be revoked, and all works shall be immediately stopped, and a notice of this action shall be posted on the works, and the owner, agent or contractor shall be notified in writing that the structure or works is, or is being constructed in violation of these ordinances.

3. And if the said person or persons shall fail or refuse to comply with said orders and make the necessary corrections, then there shall be no more work done on the said building, structure, or premises, by any person or workman whatsoever; and,

4. The violation of said posted notice shall be a misdemeanor.

Idem.

PART III.

Building Inspection.

256. 1. The Building Inspection Department shall not issue a permit for any works, changes or repairs on any building, sign, works or structure whatsoever, if said building, sign, works or structure is of unlawful construction, provided that a permit may be issued to put any building, works or structure in a lawful condition.

2. Repairs of lawful buildings or structures (except stairways, elevators, fire escapes, doors, windows, and other means of ingress or egress) the value of which will not exceed $25.00 may be made without cost for a permit, provided, that this shall not be construed as permission to erect any new structure or works whatsoever, nor to proceed with such repairs without a permit, and further provided, that every permit shall be null and void and canceled if active work is not begun within thirty days from the date of issuance, and further provided, that such time may be extended by the Supervisor at his discretion, and further provided that it shall be unlawful to proceed with any works where such permits are necessary without having said permit on the premises and kept on the premises all the time during the progress of said works.

3. Fees for permits of buildings and structures as herein provided for shall be as follows:

Value of	$ 25.00	to and including	$ 50.00.....	$ .50
Value of	50.00	to and including	100.00.....	1.00
Value of	100.00	to and including	500.00.....	1.50
Value of	500.00	to and including	1,000.00.....	2.00
Value of	1,000.00	to and including	2,000.00.....	3.00
Value of	2,000.00	to and including	5,000.00.....	4.00
Value of	5,000.00	to and including	8,000.00.....	6.00
Value of	8,000.00	to and including	10,000.00.....	8.00
Value of	10,000.00	to and including	11,000.00.....	10.00
Value of	11,000.00	to and including	12,000.00.....	11.00
Value of	12,000.00	to and including	13,000.00.....	12.00
Value of	13,000.00	to and including	14,000.00.....	14.00
Value of	14,000.00	to and including	15,000.00.....	15.00
Value of	15,000.00	to and including	17,000.00.....	18.00
Value of	17,000.00	to and including	20,000.00.....	20.00

For all over the $20,000.00 in value the additional sum of twenty cents per one thousand of fractional part thereof.

FEES FOR SIGNS SHALL BE AS FOLLOWS:

For strip cloth sign, each	$ .25
For sign containing 20 square feet or less	.25
For sign containing 20 to 40 square feet	.50
For sign containing 40 to 70 square feet	1.00

And the additional sum of twenty-five cents for each additional ten square feet, or fraction thereof.

No fee for small signs under a value of $2.50 (strip cloth signs excepted.)

FEES FOR BILLBOARDS AND SIGN BULLETINS.

Fees for billboards or bulletin 100 square feet or less	$ .50
Fees for billboards or bulletin 100 to 200 square feet	.75
Fees for billboards or bulletin 200 to 300 square feet	1.00
Fees for billboards or bulletin 300 to 400 square feet	1.50

And the additional sum of twenty-five cents for each additional 100 square feet or fraction thereof.

FEES FOR AWNINGS.

For each awning erected on a business front, side, or rear on first story which is 20 feet wide or under, each	$ .25
For such awnings as above over 20 feet in width, each	.50
For each window awning above first story as above, each	.10

Repairs on awnings to the value of $1.50 may be made without permit.

Lawful awnings may be erected on private residences located inside of property line and not overhanging public thoroughfares without permit or fee for same, and provided that permit is not necessary for the removal or rehanging of old awnings where they are removed and stored for the winter.

Fees for fire escapes, each	$2.00
Fees for Marquise, each	3.00
Fees for operators of picture machines (new license)	2.00
Fees for operators of picture machines (renewal license)	1.00
Fees for house moving, each	5.00

Provided that a house being moved within private propertly lines, and does not extend to, or beyond said property line, may be made under a valuation fee charged under the schedule herein provided for buildings and structures, and further provided, that small structures of not over 200 square feet of floor space may be moved from one point to another as herein provided, same is to be moved promptly

and continuously on the same day without obstructing the public thoroughfare for more than 10 hours, and which may be executed without bond therefor.

Idem.

257. *Storage or Piling of Materials.*

1. In no case shall the storage of materials or using of space on street, alley or sidewalk be allowed or done in such manner as would in any way interfere with the passage of vehicles between moving street cars and curb and the material or space to be used on at least one side of the street; and,

2. Permits for same must be obtained from the Supervisor of Buildings at his discretion.

3. And when any excavation of pavement or any other area used by the public is being excavated, built under, or adjacent to any new or old building or any structural improvement connected therewith, said Building Inspection Department may issue a permit therefor, which shall not be valid until approved by the Commissioner of Streets, Sewers and Sidewalks.

4. The Supervisor of Buildings shall designate such space as his judgment may deem best for piling of material and order such fences, barricades, shelters and scaffolds as are necessary for the use of contractors in constructing buildings and works, all of which may remain a reasonable time, as determined by the Supervisor, for the storage of building material.

5. *Provided,* such fences, barricades, etc., shall not interfere with the public traffic and travel and no debris, or materials not to be used in the new structure or works shall be piled, stored, or allowed to remain upon the streets, sidewalks, or alleys, but shall be removed at once.

6. And any person or persons having the use of any portion of the street or sidewalks for the purpose of erecting or repairing any building (or for any other purpose) shall cause red lights in such numbers as may be necessary (spaced not over fifty feet apart) to be placed in a conspicuous place in front and along such construction and works and kept burning from sunset until sunrise each and every night the entire time of occupation.

Idem.

7. During the time of such occupation of the street or sidewalk for such building operation the person or persons so occupying the same, whether with material or otherwise, shall enter into a good and sufficient bond to maintain and keep in repair any temporary

sidewalks, fences, sheds or other obstruction on the street or sidewalk or over the same, and shall hold the City harmless from any damages that may be sustained by any person by reason thereof.

Board of Commissioners, Ord. 891. Approved Jan. 3, 1917. *Idem.*

PART IV.

258. *Passage Around Building or Material.*

1. The Supervior may grant limited permission in writing to enclose a part or all of the sidewalk in front of any building or structure being erected or remodeled with a substantial close board fence six feet high, *provided* that a heavy board walk four feet wide is maintained around the same.

2. Or an approved shed of heavy materials and joist for floor, which shall be at least nine feet high and cover entire sidewalk or passageway.

3. No building materials, tools, machinery or appliances shall be permitted to remain on the streets or thoroughfares in a manner to interfere with convenient traffic, and during the time of occupation of the streets or thoroughfares for any building operations whatsoever, the person, firm or corporation occupying any portion of said streets or thoroughfares shall maintain and keep in thorough repair such temporary sidewalks, fences, sheds, scaffolds, enclosures or coverings as have been permitted by the Supervisor to be erected by such person, firm or corporation for the protection of the public.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

259. The Supervisor may at any time he considers it necessary, for safety or convenience, order such changes in, or the removal of all such scaffolds, walks, fences, sheds, enclosures, etc. (as are herein provided for) to be taken down and removed, and the thoroughfares and sidewalks cleaned up and opened to the public within twenty-four hours after date of written notice to the said person, firm or corporation herein stated.

Idem.

260. *Bond for Wrecking or Removal of Buildings.*

1. It shall be unlawful for anyone to wreck any building or structure within the City of Nashville or to erect any temporary sidewalks, fences, sheds or enclosures or scaffolds (as herein noted) over a public thoroughfare without first obtaining the approval of,

and a permit from the Supervisor of Buildings therefor, and executing such good and sufficient bond (as may be required and approved by the Commissioner), indemnifying the City of Nashville against all loss, damage or expense which might accrue because of the wrecking or removal of such building, structure or works, or for the proper maintenance of, and responsibility for such temporary sidewalks, fences, scaffolds and enclosures as are herein provided for. *Provided,* that any building or structure such as small cottages, outhouses or similar structure may be wrecked, or moved and reset, on the same lot without the execution of a bond therefor, and further *provided* that above proviso shall not apply to buildings being wrecked or removed when abutting on the property line.

Idem.

261. *House Moving.*

1. Any person desiring to move a building to a new location within the city limits shall file a written application with the Supervisor therefor, setting forth the kind of building to be moved, its original cost and present value, its dimensions in extreme length and height and width, and present location, the route to be taken, and the particular lot or site to which it is proposed to be moved.

The Supervisor shall thereupon examine and take into consideration the present value of such building, and whether the proposed removal can be made without serious injury to person or property.

And if the works are feasible he may issue a permit therefor, which shall become valid when the proper bond has been filed with the Commissioner and approved by him.

The permit shall state the streets or alleys along which the removal shall be made.

Provided that no building shall be moved from the Third Zone into the Second Zone, or from the Second Zone into the First Zone, unless such buildings comply with the zone requirements.

The owner or contractor shall cause written notice thereof to be given the Superintendent of Fire Alarm, Telephone and Electric Light Companies and others whose property may be affected by such removal.

Idem.

262. *Conflict Between Special and General Provisions.*—Whenever any provision or requirement herein relating especially to the construction, equipment, maintenance or operation of any building or structure or part of a building or structure used for the purpose of more than one class and there shall be a conflict with the general

provisions herein relating to the several classes of construction, equipment, maintenance or operation of such combination of buildings or structures generally, the specific provisions for the better class or risk of building or structures contained in such class or group shall govern each case, and such building or structure shall be constructed, remodeled or maintained accordingly.

Idem.

263. *Buildings Erected Within Fire Retarding Zone.*

1. All new buildings erected, or old buildings remodeled or rebuilt to an extent of 50 per cent of the total value of such building, within the area of the Fire Retarding Zone up to and including two stories in height, shall have fire retarding construction for floors, inside walls, etc.

2. Such buildings more than two stories and up to and including four stories, may preferably be of fire proof construction, or shall be of mill construction.

3. And all buildings more than four stories in height shall be of fireproof construction.

Idem.

264. *Debris to be Dampened.*—Every contractor or other person repairing or tearing down buildings, or in removing debris from any building, shall keep all such debris thoroughly dampened with water to prevent the dust from rising.

Idem.

PART V.

Definitions.

265. The following terms when used in this Code shall be construed to have the meaning here given them.

Words used in the present tense include the future as well as the present; the singular number includes the plural, and the plural the singular; the word "person" includes a corporation or co-partnership as well as an individual; "writing" includes printing, printed, or typewritten matter.

1. *Apartment House.*—Any building which is intended or designed for or used as the home or residence of two or more families, or households living independently of each other.

2. *Approved.*—The term "approved" refers to a device, material, or construction which has been approved by the Underwriters' Labora-

tories; or such approval may be granted by the Supervisor of Buildings as a result of tests or investigation made under his direction; or he may issue approval upon satisfactory evidence of competent and impartial tests or investigations conducted by others.

3. *Approved Fire-Resisting Roofing.*—Roofing which shall at least meet the requirements of the test specified.

4. *Areaway.*—An open sub-surface space adjacent to a building for lighting or ventilating cellars or basements.

5. *Area of a Building.*—The area of the horizontal cross-section at the ground level measured to the center of party walls or fire walls, and to the outside of other walls.

6. *Basement.*—A story partly but not more than one-half below the level of the curb.

7. *Bearing Wall.*—A wall which supports any load other than its own weight.

8. *Billboard.*—A billboard is a certain class of construction used for posting of paper or a similar class of advertising matter thereon, and is constructed of wooden posts and braces, and having a heavy galvanized sheet metal face secured to wooden frame strips and a heavy wooden mould on face margins and a band on edges each to be 1½x5 inches.

9. *Bulkhead or Pent House.*—A structure erected on the roof of a building for the purpose of enclosing stairways to the roof, elevator machinery, water tanks, ventilating apparatus, exhaust chambers or other building equipment machinery and for janitor's quarters. When used only for the above mentioned purposes, such structures need not be considered in determining the height of the building.

10. *Cellar.*—A story whose height is more than one-half below the level of the curb. It shall not be counted as a story in determining the height of a building.

11. *Cement Plaster.*—A plaster composed of one part Portland cement, not more than three parts sand, and not more than 10 per cent. by volume of hydrated lime, with hair or other binder when necessary.

12. *Cement-tempered Plaster.*—A lime or gypsum plaster tempered with not less than 20 per cent of Portland cement.

13. *Commissioner.*—The word "Commissioner" as used in this ordinance shall be taken to mean the Commissioner of Fire, Sprinkling and Building Inspection.

14. *A Court* is an open, unoccupied space, other than a yard, on the same lot with a building. A court not extending to the street or

yard is an inner court. A court extending to the street or yard is an outer court. If it extends to the street it is a street court. If it extends to the yard it is a yard court.

15. *Curb.*—Wherever the word "curb" refers to the height of a building or to the definition of a basement or cellar, it shall be construed to mean the curb level or established grade at the center of the principal front of the building fronting on one street only; in the case of a building fronting on two or more streets, the curb level at the center of the front facing on the highest curb shall be taken, unless the highest curb is more than ten feet higher than the lowest curb, in which case the average level of the two curbs shall be taken. Wherever the word "curb" refers to an excavation, the level of the curb shall be taken at the intersection of the lot lines and the curb lines. In the case of a building fronting on two or more streets, the curb levels shall be taken on each street at the intersection of the lot lines and the curb lines, and their relation to an adjoining building or buildings be as though two or more excavations were to be made.

16. *Curtain Wall.*—Any exterior non-bearing wall between columns or piers, which is not supported by beams or girders at each story.

17. *Dead Load.*—The weight of the walls, framing, floors, roofs, tanks, with their contents, and all permanent construction.

18. *Department.*—The Department of Buildings.

19. *Division Wall.*—Any interior wall in a building.

20. *Dwelling.*—A residence building designed for, or used as, the home or residence of not more than two separate and distinct families.

21. *Existing Building.*—A completed building or structure, or one for which plans have been filed previous to the date on which this Code goes into effect.

22. *Exterior Wall.*—Any outside wall, or vertical enclosure of a building, other than a party wall.

23. *Factory.*—A building or portion thereof, designed or used to manufacture or assemble goods, wares, or merchandise, the work being performed wholly, or principally, by machinery.

24. *Fibre Plaster Board.*—A board consisting of an intimate mixture of gypsum plaster composition and a fibrous binding material.

25. *Fire Door.*—A door, frame, and sill which will successfully resist a fire for one hour in accordance with test specifications.

26. *Fire Exit Partition.*—A sub-dividing partition built for the purpose of protecting life by providing an area of refuge. See Section 309.

27. *Fireproof.*—As used in this Code, except as elsewhere prescribed by test for particular types of construction, refers to materials or construction not combustible in the temperatures of ordinary fires, and which will withstand such fires without serious impairment of their usefulness for at least one hour.

28. *Fire Shutter.*—A shutter which will successfully resist a fire for one hour in accordance with test specifications. See Section 439.

29. *Fire Wall.*—A wall built for the purpose of restricting the area subject to the spread of fire.

30. *Fire Window.*—A window frame, sash, and glazing which will successfully resist a fire for one hour in accordance with test specifications given in Section 439, and has been approved upon such test. No single pane in a fire window shall exceed 720 square inches.

31. *Foundation Wall.*—Any wall or pier built below the curb level or nearest tier of beams to that level.

32. *Garage.*—A garage is that portion of a structure in which a motor vehicle containing volatile inflammable oil in its fuel storage tank is stored, housed or kept; all that portion of such structure that is on, above, or below the space mentioned in which is not separated therefrom by tight, unpierced fire walls and fireproof floors.

(a) "Public garage" is defined as a building used, let or rented for the purpose of selling, storing, or housing or of repairing or working on such vehicles as described above.

(b) "Private garage" is defined as a building used by an individual, or by one or more families or persons for the housing or storage on private premises of not more than three such vehicles as described above.

33. *Gypsum Block.*—The term "gypsum block" shall include tile or blocks composed of gypsum and not to exceed 5 per cent by weight of combustible fibre binding material; or a mixture of crushed cinders and gypsum, commonly called "Cinder-plaster blocks."

34. *Height of a Building.*—The vertical distance from the curb level to the top of the highest point of the roof beams in the case of flat roofs, or to the average height of the gable in the case of roofs having a pitch of more than 20 degrees with a horizontal plane. When a building faces two or more streets having different grades, the measurement shall be taken at the middle of a facade on the street having the greatest grade. When a building does not adjoin the street, the measurement shall be taken from the average level of the ground adjoining such building. In measuring the height of a wall, the height of the parapet above the top of the roof beams shall not be included. See Section 346.

35. *Hotel.*—Any building or portion thereof, designed or used for supplying food or shelter to residents or guests, and containing less than fifteen sleeping rooms above the first story.

36. *Illuminated Signs.*—An illuminated sign shall be defined as a double faced sign suspended over a sidewalk and at right angles to a building, front or diagonal on a corner, and constructed of metal and glass with sufficient hollow space between the faces to admit of necessary wiring for electricity, or pipes for gas; the lights may be inserted in the face to give exterior light, or remain in the hollow space; all glass shall be of wire fabric make and not less than 3/16 inch in thickness.

37. *Incombustile.*—Materials or construction which will not ignite and burn when subjected to fire.

38. *Joint Party Wall.*—A joint party wall is a solid wall built on a dividing property line and projecting over both sides of said line and used to separate or support two or more buildings.

39. *Length of Building.*—Its greatest longitudinal dimension.

40. *Live Load.*—All loads other than dead loads. All partitions which are subject to removal or rearrangement shall be considered as live load.

41. *Non-Bearing Wall.*—One which supports no load other than its own weight.

42. *Occupied.*—Shall be construed to mean occupied, to be occupied, intended or designed to be occupied.

43. *Office Building.*—One used for professional or clerical purposes, but not for manufacturing, storage, or sale of goods, except by sample; also excepting the first story, which may be used for commercial purposes. No part of such building shall be used for living purposes except by the janitor's family.

44. *Outhouses.*—All structures not exceeding 12 feet in height, nor more than 400 square feet in area, exclusive of sheds.

45. *Owner.*—Any person, firm or corporation owning or controlling property, and includes a duly authorized agent or attorney. Guardians, conservators or trustees shall also be regarded as owner.

46. *Panel or Enclosure Wall.*—An exterior non-bearing wall in a skeleton structure built between columns or piers and supported at each story.

47. *Parapet Wall.*—That portion of any wall which extends above the roof line and bears no load except as it may serve to support a tank.

48. *Parking.*—(a) Parking is the space between the sidewalk and the building line.

(b) Parking Line.—The line separating parking and sidewalk.

49. *Party Wall.*—A wall used or adapted for joint service between two buildings.

50. *Public Building.*—See Section 267.

51. *Public Hallway.*—A hall, corridor or passageway used in common by the occupants of a building and serving as a means of communication for the public between an entrance to any story of a building, and the various rooms, apartments or spaces in that story.

52. *Retaining Wall.*—One constructed to support a body of earth or to resist lateral thrust.

53. *Shed.*—A roofed structure, open on all sides, which does not exceed 15 feet in height nor more than 500 square feet in area.

53. *Sign Bulletin.*—A certain class of construction erected and used on open lots, only for the purpose of painting signs and other advertising matter thereon, and is constructed with wooden posts and braces, and having a heavy galvanized sheet metal face secured to wooden framing strips, and a heavy wooden mould 1½x5 inches around the edges and a band of same size.

55. *Skeleton Construction.*—A form of building construction wherein all external and internal loads and stresses are transmitted to the foundations by a rigidly connected framework of metal or reinforced concrete. The enclosing walls are supported by girders at each story.

56. *Skylight.*—Any cover or enclosure placed above roof openings for the admission of light.

57. *Slow-Burning Construction.*—See Section 266.

58. *Smokeproof Tower.*—See Section 301.

59. *Story.*—That part of any building comprised between any floor and the floor or roof next above. In case any floor or the combined area of floors at any one level extends over less than 20 per cent. of the horizontal area included within the outside walls at that level, the same shall not be considered as a floor for the purpose of determining story heights.

60. *Structure.*—Includes the terms building, appurtenance, wall, platform, staging, or flooring used for standing or seating purposes; a shed, fence, sign, or billboard on public or private property, or on, above or below a public highway.

61. *Supervisor.*—The Supervisor of Buildings, or such other official title as the Board of Commissioners may apply to that office or position, which has assigned to it such duties as are generally recognized in supervising building construction. It shall also include any deputy or assistant authorized to represent such public official.

62. *A Tenement House.*—Is any house or building, or portion thereof, which is either rented or leased, to be occupied in whole or in part as the home or residence of two or more families living independently of each other, and doing their cooking upon the premises; and having a common right in yards, hallways, stairways, etc.; and includes apartment houses, flat houses and all other houses so occupied.

63. *Theatre.*—Any building or part of a building designed or used for theatrical or operatic purposes with accommodation for an audience, and having a permanent stage upon which movable scenery and theatrical appliances are employed; including also moving picture theatres, either with or without a stage, and having capacity as above stated.

64. *Warehouse.*—A building or portion thereof, designed or used for the storage of merchandise.

65. *Width of a Building.*—The horizontal dimension next in value to the length.

66. *Wired Glass.*—Glass not less than one-fourth inch thick enclosing a layer of wire fabric reinforcement having a mesh not larger than seven-eighths inch, and the size of wire not smaller than No. 24-B., and S. guage.

67. *Workshop.*—A building or room in which articles of merchandise are manufactured or repaired wholly or principally by hand.

68. *A Yard.*—Is an open, unoccupied space on the same lot with a tenement house, between the extreme rear line of the house and the rear line of the lot.

69. *Zone.*—The word "Zone" is used herein to denote the division of the city into sections so that buildings constructed of certain materials or character may, or may not be erected therein. For example, (1) "The Fire Retarding Zone," (2) "The First Zone," (3) "The Second Zone," (4) "The Third Zone," and (5) "The Factory Zone."

Idem.

PART VI.

Classification of Buildings.

266. *Classification of Buildings by Construction.*

For the purposes of this Code, buildings shall be classified according to the method of construction as follows:

I. Frame Construction, (a) wooden faced walls, (b) metal faced walls.

II. Veneered Construction.

III. Non-Fireproof Construction, (a) Ordinary construction, (b) mill construction, (c) fire retarding construction.

IV. Fireproof Construction.

1. *Frame Construction.*—(a) Structures having wooden framework faced on outside with wooden siding or wooden shingles, and using a roof of wooden shingles, and may be erected in the Third Zone only.

(b) For Factory Zone.—Structures may be erected having wooden framework with sheathing on outside, and faced with approved sheet metal for exterior wall surface, or masonry walls laid in cement mortar with a minimum of 8 inches in thickness and not over 30 feet in height and properly braced by sufficient cross walls, piers or buttresses, not less than 16 feet apart and using a roof of approved incombustible materials. Buildings of this class may be erected within the Factory Zone only for shops, warehouses or similar purposes, and the basement floor (if any) shall be of fireproof construction.

2. *Non-Fireproof Construction.*—The term "non-fireproof construction" shall apply to all buildings or structures having exterior masonry walls with floors and other interior construction wholly or in part of wood.

Ordinary Construction.—(a) A building having masonry walls with floors and partitions of wooden joists and stud construction, the supporting posts and girders may be of wood or of metal, or (a2) having veneered construction consisting of wooden frame work with wooden sheathing on the outside and faced with brick, stone, terra cotta, concrete, or tile not less than four inches thick, or a face of Portland cement stucco, or similar approved plastic material, not less than ¾ of an inch thick on approved metal lath or plaster board not less than ⅝-inch thick. Such walls may have the gable ends faced with wooden shingles which have been dipped two times in creosote shingle stain, or approved asbestos composition shingles not less than 3/16 of an inch thick. Or a composition shingle of an approved make of paper fibre with a slate or sand surfacing and well nailed at each lower corner to control the flexibility thereof.

This class of gable construction may be used on one and two-story residences or similar structures in the Second and Third Zones only.

(b) Mill Construction.—(Sometimes called "slow-burning construction.") A building having masonry walls, and heavy timber interior construction.

(c) Fire-Retarding Construction.—(c1) Consists of such fire-retarding works as stud walls fire-blocked and having metal lath or plaster board on both sides and plastered with cement plaster, and wooden joist with double thick floors not under 7/8-inch each with two-ply of 14-pound asbestos paper between, and all ceilings covered with (1st) sheet metal.

(c2) or metal lath or plaster board and plastered with cement plaster.

(c3) And all stairways and elevator shafts enclosed as provided for mill construction.

(c4) And all outside walls and Roofs of fireproof materials.

(c5) And openings on courts or alleys as provided for fireproof buildings and structures.

Idem.

4. *Fireproof Construction.*—Buildings of masonry, steel or reinforced concrete construction in accordance with Sections 374 to 438, shall be considered fireproof.

Board of Commissioners, Ord. 788. Approved July 13, 1916.

Idem.

267. *Classification of Buildings by Occupancy.*—All buildings shall be classified according to their occupancy or use under one of the three following groups: Public Buildings, Residence Buildings, and Business Buildings. These groups shall be further subdivided into classes, designated as A, B, C, D, E and F, as follows:

1. Public Buildings: Class A; Class B.
2. Residence Buildings: Class C; Class D.
3. Business Buildings: Class E; Class F.

1. *Public Buildings. When Required Fireproof.*—Public buildings shall be construed to include all buildings or structures accessible to the public, and in which people may congregate for civic, political, educational, religious, amusement or transportation purposes; or in which they may be voluntarily or forcibly detained or housed for safety, punishment, observation, or care.

Class A. Armories, asylums, bath houses (with sleeping accommodations other than those required for janitor), city halls, colleges, courthouses, detention buildings, police station, hospitals, libraries, museums, nurseries, railway passenger stations, schools, and theatres.

A1. Buildings of this class shall be of fireproof construction, except that schools in which no pupils are accommodated above the second story may be of non-fireproof construction, and provided that floors in moving pictures theatres may be of mill construction as provided in Section 520, paragraph 1.

A2. Where armories, railway passenger stations, museums and similar buildings have large arched exposed roof construction, the fireproofing of the structural members of these roofs may be omitted if the construction of the remainder of the buildings would reasonably warrant such omission.

Class B. Amusement halls, churches, exhibition buildings, lodge rooms, and public halls.

Buildings of this class may preferably have the floor over the cellar or basement which is nearest to grade level of fireproof construction. *Provided* that all rooms containing heating apparatus, including the doors and windows thereof, shall be of fireproof construction.

Buildings of this class over three stories, or 40 feet high, shall be of fireproof construction throughout, except that church spires need not be fireproof until they exceed 75 feet in height.

Every permanent structure intended for the seating or accommodation of the public, commonly known as grandstands, erected within the fire limits, shall be of fireproof construction, except that the seats may be of wood, and the structural steel work may be unprotected. When portions of such structures are enclosed, the enclosing construction shall be fireproof.

2. *Residence Buildings. When Required Fireproof.*—Residence buildings shall be construed to mean and include all buildings in which sleeping accommodations (other than for janitor or watchman) are provided.

Class C. Flats, apartments, club houses, and studios with more than fifteen sleeping rooms, dormitories, hotels and lodging houses.

(1) Buildings of this class when permitted of frame construction with veneered surface to outside walls shall not exceed two stories or 30 feet in height.

(2) All buildings of this class three stories in height shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

(3) Buildings of this class over three stories, or 40 feet high, shall be of fireproof construction throughout.

Class D. Single dwellings of tenement houses not over two stories high and all other residence buildings (not specified in Class C) are to be erected only in the Third Zone.

(1) Buildings of this class over two stories, or 30 feet high, shall have the floor over cellar or basement which is nearest to grade level of fireproof construction.

(2) Buildings of this class over three stories, or 40 feet high, shall be of fireproof construction throughout.

(3) When the lower stories or portions thereof in non-fireproof buildings of Classes C and D are occupied for business purposes, the construction shall be made in accordance with the requirements of Section 361.

3. *Business Buildings. When Required Fireproof.* Business buildings shall be construed to mean and include all structures used for or adapted to the transaction of business, the operation of machinery, the manufacture or storage of machinery or materials, the housing of live stock, or for any other industrial purpose.

Class E. Factories, office buildings, printing houses, restaurants, stables, stores, warehouses, and workshops, or similar structures.

(1) Buildings of this class, of ordinary construction over two stories, or 30 feet high, shall have the floor over the lowest story of fireproof construction.

(2) Buildings of this class over four stories, or 55 feet high, shall be of fireproof construction throughout, or of mill construction.

(3) Mill construction buildings shall not exceed 65 feet in height.

Class F. Car barns, foundries, light and power plants, railroad freight stations; also special industry buildings, constructed and occupied exclusively for a special purpose or industry and not otherwise classified, such as coffee roasters, dry cleaning establishments, grain elevators, ice-making plants, laboratories, malt houses, oil houses, oil refineries, refrigerating plants, rendering plants, soap factories, slaughter houses, wharf buildings and similar structures, also garages accommodating more than three cars, or in which cars are stored on more than one floor.

(1) Buildings of this class, such as garages (as herein defined), oil houses, oil refineries, rendering plants, etc., and buildings or portions of buildings which are used for the storage or handling of large quantities of combustible packing or refuse material, shall be only of fireproof construction.

(2) All other buildings of Class F shall be of fireproof, or mill construction, if within the fire limits, or, if they exceed 55 feet in height.

(3) Buildings of Class F, whether of fireproof construction and within the fire limits, or of non-fireproof construction and outside the fire limits, shall only be erected in such isolated localities and under such conditions as are provided by this Code.

(4) Storage of lumber shall not be permitted within the fire limits, *provided,* that yards existing at the enactment of this ordinance may be permitted to remain.

(5) When any building is not classified, or where there is any doubt as to its classification, the Supervisor shall designate under which class it shall be placed.

(6) When any building is used for the purpose of two or more classes as herein defined, that portion devoted to the occupancy or use of a particular class shall be constructed in accordance with the requirements of that class, unless such construction shall prove impracticable, or where there shall be a conflict between the requirements of the different classes, in which case the class requiring the safest form of construction shall govern the entire building.

Board of Commissioners, Ord. 759. Approved June 7, 1916. *Idem.*

PART VII.

Permissible Area of Lot Occupied.

268. *Limits of Lot Area Occupied.*

1. Except as hereinafter provided, all buildings shall have uncovered spaces for providing light and air. These spaces shall be open to the sky from the top of the second story window sills, and shall be in accordance with the following table; in which all paragraphs from 2 to 11, inclusive, shall be read as if containing the words "except theatres, special industry buildings, and tenement houses."

2. Buildings of Class C, on lots other than corner lots:

Twenty per cent of total lot area when not exceeding 75 feet in height.

Twenty-five per cent of total lot area when over 75 feet and not exceeding 125 feet in height.

Buildings of Class C, on corner lots:

Fifteen per cent of total lot area when not exceeding six stories, or 75 feet in height, and shall increase 2 per cent for each additional story up to 125 feet in height.

3. All buildings not enumerated in paragraph 2 on lots other than corner lots:

Ten per cent of total lot area when not exceeding 75 feet in height.

Twelve and one-half per cent of total lot area when over 75 feet and not exceeding 125 feet in height.

4. All buildings not enumerated in paragraph 2 on corner lots not exceeding 2,500 square feet in area:

Five per cent of total lot area when not exceeding 75 feet in height.

Seven and one-half per cent of total lot area when over 75 feet and not exceeding 125 feet in height.

5. When buildings are on corner lots, more than 2,500 square feet in area, that portion of the building upon the excess lot area over and above 2,500 square feet shall be provided with open spaces in accordance with the requirements of paragraph 2, or 3, as the case may be, of this section.

6. Every building (other than buildings of Class C) which occupies lots fronting upon three or more streets may occupy the entire lot area, *provided* the maximum width of the building does not exceed 75 feet.

7. The total area of the uncovered spaces of all buildings which are more than 75 feet in width and occupy an entire block front facing upon three or more streets may be less by 25 per cent than is required by the provisions of paragraphs 3, 4, 5 and 6 of this section.

8. There shall be a clear space not less than five feet in width, at and above the second story window sills, between the rear line of every building and the rear line of every lot except corner lots. This shall not apply to buildings which extend through from one street to another, or from a street to an alley.

9. In every court or yard the distance between opposite boundary walls shall be not less than five feet at any point for a height not exceeding 75 feet, and shall be at least one-half inch greater throughout its height for every additional foot above 75 feet.

10. When existing buildings are extended or increased in area, the ratio of total uncovered space to the area of the lot shall not be

required to be greater than it would be were the entire building erected in accordance with this Code.

11. In order to fulfill the requirements of this section, uncovered spaces may be increased in size as they go upward if thereby they provide at every given level the requisite area of uncovered space for a structure of that particular height.

Idem.

PART VIII.

Excavations and Foundations.

269. *Excavations.*—The person causing any excavation to be made for a building, shall have the same properly guarded and protected. Wherever necessary he shall at his own expense properly sheath, pile and erect masonry or steel construction, or a sufficient retaining wall to permanently support the adjoining earth. Such retaining wall shall extend from full depth of excavation to the level of the adjoining earth and shall be properly coped.

Idem.

270. *Excavations Affecting Adjoining Property.*

1. Whenever an excavation is not intended to be or shall not be carried to a depth of more than 10 feet below the curb level, the owner of every adjoining or contiguous wall or structure, yard, or bank of earth or rock shall protect the same, so that they shall be and remain as safe as before such excavation was begun. Such owner shall be permitted to enter upon the premises where the excavation is being made when necessary for this purpose.

("*Provided,* however, if the foundation of any such adjoining or contiguous wall or structure rests upon solid rock and is in good condition, then the owner of the land upon which such excavation work, if accorded the necessary license to enter upon the adjoining land, shore up, protect, and save from injury all footings, foundations, walls, or parts thereof which are liable to be injured by reason of such excavation.")

2. Whenever an excavation of either earth or rock for buildings or other purposes shall be intended to be or shall be carried to the depth of more than ten feet below the curb, the person causing such excavation to be made shall at all times from the commencement un-

til the completion thereof, if accorded the necessary license to enter upon the adjoining land, and not otherwise, at his own expense, preserve any adjoining or contiguous wall, structure, yard, or bank of earth or rock from injury, and support the same by proper foundations or retaining walls, so that the said wall, structure, yard, or bank of earth or rock shall be and remain practically as safe as before such excavation was commenced, whether the said adjoining or contiguous wall, structure, yard, or bank of earth or rock are down more or less than ten feet below or above the curb. For this purpose such approved foundations or retaining walls may be built upon the property upon which the wall, structure, yard, or bank of earth or rock is situated. If the necessary license is not accorded to the person or persons making such excavation, then it shall be the duty of the owner refusing to grant such license, at his own expense, to make the adjoining or contiguous wall, structure, yard, or bank of earth or rock, safe, and support the same by proper foundations so that adjoining excavations may be made, and shall be permitted to enter upon the premises where such excavation is being made for that purpose, when necessary.

Idem.

271. *Foundations Adjoining Party Walls.*

1. In case a party wall is intended to be used by the person causing an excavation to be made, and the footings and foundations of such party wall are in good condition and sufficient for the uses of both the existing building and the new one, then the person causing the excavation to be made, shall, at his own expense, preserve such party wall from injury, and support the same by proper means, so that said party wall shall be and remain as safe as before the excavation was begun.

2. In case the footings and foundations of any said party wall are not in good condition, or not sufficient for the uses of both the existing building and the new one, it shall be the duty of the person causing such excavation to be made to extend such defective or insufficient footing or foundation, or to replace same with a new footing or foundation. Such extended or new footing shall project on each side of the party line such a distance as to bring the center of the footing under the center of the wall, so that the total load upon the wall may be uniformly distributed over the area of the footing. Any other method may be used which will adequately support the party wall. In order that this may be done, the person causing the excavation to be made shall be allowed access to the adjoining premises.

3. In case any excavation or the removal of any existing building, shows any adjoining wall or structure to be unsafe at the time of the excavation was begun, it shall be the duty of the person causing the excavation to be made, or the building to be removed, to forthwith report the fact, in writing, to the Supervisor, who shall upon the receipt of such notice, forthwith cause an inspection of such adjoining premises to be made, and if such inspection proves the aforesaid wall or structure to be unsafe, it shall be the duty of the Supervisor to declare such wall or structure to be unsafe and cause the same to be repaired as herein provided.

4. If the person whose duty it shall be to preserve or protect from injury any wall or structure shall neglect or fail so to do within twenty-four hours after the receipt of a notice from the Supervisor, then the Supervisor may enter upon the premises and employ such labor, and furnish such materials and take such steps as, in his judgment, may be necessary to make the premises safe and secure, or to prevent the same from becoming unsafe or dangerous, at the cost and expense of the person whose duty it is to keep the same safe and secure.

5. No foundation wall shall be built up against another foundation party wall until the face of the old party wall is trimmed and made plumb and straight to the party line; all such trimmings shall be done at the expense of the constructing property owner.

Idem.

272. *Bearing Capacity of Soil.*

1. When doubt arises as to the safe sustaining power of the soil upon which a building is to be erected, the Supervisor may order borings to be made, or he may order tests of the sustaining power of the soil to be made by and at the expense of the owner of the proposed building. Such test shall be made in accordance with specifications established by the Supervisor, and he shall be notified before any test is made, so that he may be present or represented thereat. The records of such boring or tests shall be filed with the Supervisor.

2. The safe bearing capacity of different soils shall be as determined by the Supervisor, and in the absence of tests shall not exceed the values given in the following table:

Character of Soil.	*Tons per Square Foot.*
Soft clay	1
Firm clay, fine sand, or layers of sand and clay, wet	2

Clay or fine sand, firm and dry	3
Hard clay, coarse sand, gravel	4
Hard pan	8 to 15
Rock	15 to 72

Idem.

273. *Foundation Walls.*

1. Foundation walls shall be construed to include all walls and piers built below the curb level, or nearest tier of beams to the curb, or to the average level of the ground adjoining the walls, to serve as supports for walls, piers, columns, girders, posts or beams.

2. If built of rubble stone or brick they shall be at least 8 inches thicker than the wall next above them to a depth of 12 feet below the curb level; and for every additional 10 feet, or part thereof deeper, they shall be increased 4 inches in thickness.

3. If built of brick or plain concrete and supporting walls over 30 feet in height, they shall be at least 4 inches thicker than the wall next above them to a depth of 12 feet below the curb level; and for every additional 10 feet, or part thereof deeper, they shall be increased 4 inches in thickness. In buildings not exceeding 30 feet in height, the Supervisor may at his discretion permit the foundation walls to be the same thickness as the walls above.

4. Hollow blocks may be used for the foundation walls of building not exceeding three stories or 40 feet in height, *provided* said walls are not less than the thickness required for foundation walls of brick or plain concrete. All blocks shall be laid to line and level and carefully bonded. When blocks are laid with cells vertical the stability of the walls and their resistance to water, may be increased by being filled solidly with wet concrete. Such foundations shall not be stressed beyond the limits allowed in Section 320, taken over combined area of blocks and fill.

5. Portland cement mortar only shall be used in footings and foundation walls.

Idem.

274. *Footings.*

1. The footings for foundation walls, piers and columns shall be constructed of plain concrete, reinforced concrete, or of steel grillage beams resting on a bed of concrete. Wooden footings may be used if they are entirely below the level of low water, *provided* that no footing is necessary if foundation rests on solid rock.

2. Footings shall be so designed that the loads they sustain per unit of area shall be as nearly uniform as possible, and the stresses shall conform to the requirements of this Code. The dead loads carried by the footings shall include the actual weight of the superstructure and foundations down to the bottom of the footing. All tanks or other receptacles for liquids shall be figured as being full. All vaults or similar built-in structures shall be considered parts of the building.

The live load on column footings shall be assumed to be the same as the live load in the lowest tier of columns.

3. Loads exerting pressure under the footings of foundations of buildings more than three stories in height, shall be computed as follows:

(a) For buildings in which the required live load does not exceed 75 pounds per square foot, assume the total dead load, plus 60 per cent of the full live load.

(b) For buildings in which the required live load exceeds 75 pounds per square foot, assume the total dead load, plus 75 per cent of the full live load.

In no case shall the load per square foot under any portion of any footing due to the combined dead, live and wind loads, exceed the safe sustaining power of the soil upon which the footing rests.

4. Concrete footings shall be not less than 12 inches thick, except as provided in Section 455.

5. Concrete footings shall be made of at least one part of Portland cement, and not more than two and one-half parts of sand, and five parts of broken stone or gravel.

6. Broken stone shall be hard, durable and of quality approved by the Supervisor. Where gravel is used it shall be thoroughly washed.

7. Where mass concrete is used for footings or foundations, the stone or gravel shall be of such size as will pass through a two-inch ring, and shall be free from dust or other deleterious material. Sufficient smaller aggregate shall be added to secure density, and *provided* that one man stone may be used as a coarse aggregate if spaced not less than three inches apart and three inches away from the faces of forms.

8. Stepped-up courses of brick shall have offsets of not more than one-half inch if laid in single courses, and one inch if laid in double courses.

9. If the nature of the ground and the character of the building are such as to make it necessary or advisable, isolated piers may be used instead of a continuous wall to support the building.

10. Grillage beams shall be united by bolts and separators, and the grillage filled solid with concrete. All metal which forms a part of any footing or foundation shall be entirely encased with at least four inches of concrete.

Idem.

275. 1. Wooden piles shall be of approved timber. They shall be sound and straight. The diameter at the butt shall be not less than ten inches, and the diameter at the point shall be not less than five inches. Any pile over 20 feet in length shall be not less than 12 inches at the butt. The minimum distance between piles shall be two feet.

2. Piles shall be driven to refusal if possible, and the method of driving shall be such as not to impair their strength. The maximum load carried by a pile driven through firm soil to rock or hard pan shall be computed by multiplying the average area of cross section in inches by 500 pounds; but in no case shall such load exceed 15 tons. Piles driven through loose, wet soil to solid rock or hard pan, shall be figured as columns unsupported lasterally for their entire length.

3. The safe sustaining power of a pile not driven to refusal, which shall in no case exceed ten tons, shall be determined by calculation based upon the following formula:

$$L = \frac{2\,W\,H}{P\quad 1}$$

in which L=the allowable load in tons (maximum ten tons),

W=the weight of the hammer in tons,

H=the fall of the hammer in feet (maximum 15 feet),

P=the average penetration in inches under the last five blows after the pile has sunk to a point where successive blows produce approximately equal penetrations.

The Supervisor shall be notified before any test is made of the sustaining power of piles, so that he may be present or represented thereat.

4. The sustaining power of wooden piles driven by steam or pneumatic hammers or by jetting shall be determined by test as directed by the Supervisor.

5. Piles shall be cut off so that the tops are always below the level of mean low water. Portland cement concrete shall be rammed down in the interspaces between the heads of the piles to a depth of not less than eight inches, and laterally for a distance of not less than twelve inches on each side of the row of piles.

6. Under frame buildings piles may be capped with timbers, the timbers shall be sound wood, not less than six inches thick, and properly joined together. The tops of all such timbers shall be below the level of mean low water, except in the case of frame buildings built over the water or on soft meadow, or similar land, in which case piles may project above the water a sufficient distance to raise the building above high tide, and then the building may be placed directly thereon.

Idem.

276. *Concrete Piles.*

1. Piles consisting of steel tubes filled with concrete shall have a minimum inside diameter of ten inches, and the thickness of the metal tube not less than ⅜-inch. The length shall not exceed forty times the inside diameter. The ends of the tube shall be faced perpendicular to its axis. No more than one splice of an approved design shall be used in the total length of the pile. When driven to rock, the load on such piles shall not exceed 500 pounds per square inch on the concrete, and 7,500 pounds per square inch on the steel. In computing the effective area of the steel, ⅛-inch of its thickness shall be deducted from the thickness of the tube to allow for corrosion.

2. Concrete piles moulded and cured before driving shall be provided with not less than 2 per cent nor more than 4 per cent of longtitudinal reinforcement with bands or hoops not less than ⅜-inch diameter, and spaced not further apart than six inches. The average diameter of the pile shall be not less than 12 inches, and the diameter at the foot not less than eight inches. The length shall not exceed thirty times the average diameter for piles driven through firm soil, and shall not exceed fifteen times the average diameter for piles driven to rock through loose wet soil, or filled ground. When driven to rock the maximum load carried on such piles shall not exceed 6,000 lbs. per square inch on the longitudinal reinforcement and 500 lbs. per square inch on the concrete at the average cross section.

The top of the piles shall be protected with a cushion cap of approved design, and when driven to rock the foot shall be provided with a metal shoe having a square bearing.

3. When piles of the types described in paragraphs 1 and 2 are not driven to rock their carrying capacity shall be determined by means of one or more test piles, and the working load shall not exceed one-half the test load under which the pile begins to settle, nor shall the prescribed unit stresses be exceeded.

4. Concrete piles cast in place shall be made in such manner as to insure the exclusion of any foreign matter, and to secure a uniform full-size section for the entire length. The average diameter of the pile shall be not less than 14 inches and the diameter at the foot not less than 8 inches. The length shall not exceed twenty-five times the average diameter. The carrying capacity of such piles shall be determined by means of one or more test piles, and the allowable working load shall be not greater than one-half the test load under which the test pile begins to settle, nor greater than 350 lbs., per square inch.

5. The concrete shall be mixed in the proportion of one part Portland cement, two parts of clean coarse sand, and four parts of broken stone or gravel of a size passing through a 1 1/4-inch diameter ring, with sufficient water to produce a plastic or viscous consistency.

6. The clear space between the heads of concrete piles shall be not less than 16 inches.

7. The permissible load upon piles driven out of plumb, and the extent to which piles may be driven out of plumb before being condemned, shall be determined by the Supervisor.

8. No pile or group of piles shall be loaded eccentrically.

Idem.

PART IX.

Walls.

277. *Brick Walls and Walls in General.*

1. Every building other than frame buildings shall be enclosed on all sides with independent or party walls of incombustible materials. This shall not preclude the construction of any story supported on piers entirely open to the outer air, *provided* that in all such buildings the floor and the ceiling of such open story shall be protected by incombustible material.

2. The masonry walls and piers of every building shall be properly and solidly bonded with mortar joints. They shall be built to a line and carried up plumb and straight.

3. All brick shall be thoroughly wet just previous to being laid, except in freezing weather, when they shall be thoroughly dry. No mason work of any description shall be built when the temperature is below 28 degrees Fahrenheit on a rising temperature, or 32 degrees on a falling temperature at the point where the work is in progress. No frozen materials shall be built upon, but shall be removed.

4. No wall of any building or structure shall be built more than two stories in advance of any other portion of the walls of the building or structure; this provision need not apply to buildings where walls are carried independently by girders at each floor. All walls shall be securely anchored and bonded at points where they intersect. Where such walls are not built at the same time, the perpendicular joint shall be regularly toothed with 4-inch offsets, and the joint shall be provided with anchors not less than 2-inch by 3/8-inch metal, with bent-up ends or cross pins to form anchorage; such anchors are to be not less than 3 feet long, extending 18 inches on each side of the joint and spaced not more than three feet apart in height.

5. The walls and beams of every building during erection or alteration shall be securely braced wherever required until the build- is enclosed.

6. In brick walls every sixth course shall be a heading course, except where walls are faced with brick in Flemish bond, in which case the headers of every third course shall be full brick and bonded into the backing. Where running bond is used, it shall be bonded into the backing by cutting the corners of every brick of every sixth course of the face brick and putting in a row of diagonal headers behind the same, or suitable metal anchors shall be used in the bonding course at intervals not exceeding one foot. Where face brick is used of a different thickness from the brick used for backing, the courses of the exterior and interior brickwork shall be brought to a level bed at intervals of not more than eight courses in height of the face brick, and the face brick shall be properly tied to the backing by a full heading course of the face brick or other approved method.

7. Face brick shall be laid at the same time as the backing, and shall in no case be laid after the backing is in place.

8. When walls of hollow blocks are veneered as permitted in Section 287, the facing shall either be bonded to the backing with

a row of headers every 16 inches, or be attached to the backing with approved metal wall ties bedded in the mortar joints. Such ties shall not be spaced further apart on centers than one foot vertically and two feet horizontally. Such veneering shall not be considered a part of the required thickness of the wall. Brick facing or veneering may, however, be considered as part of a hollow terra cotta or concrete wall (or vice verse), *provided* the veneering is bonded at least four inches into the wall at intervals not exceeding six courses of brick. When veneering is used, special care shall be taken to fill all joints flush with mortar around wall openings.

9. No timber, except inside segments, as described in Section 291, and nailing blocks not over eight inches in length, shall be placed in any masonry wall.

10. The walls of each story shall be built up the full thickness to the top of the beams above.

Idem.

278. *Piers.*

1. Every pier shall be built of squared stone, stone concrete, or approved brick. Stone or brick piers shall be laid in Portland cement mortar. Every exterior pier shall be securely anchored to the beams or girders at the level of each tier. The height of any isolated pier shall not be greater than ten times its least horizontal dimension. Except in frame buildings, no masonry pier shall be less than 16 inches square.

2. Interior piers shall not be built of stone, neither shall stone bonds or caps be used in such piers, except in frame buildings.

3. Every exterior stone or brick pier less than six square feet in cross-section, which supports a beam, girder, arch or column upon which a wall rests, or a lintel spanning an opening over ten feet wide on which a wall rests, shall have built into it, at vertical intervals of not more than six times the least dimension of the pier, approved bond stones, steel, or cast iron plates. All bond plates shall be full size of the pier.

4. Steel bond plates shall be not less than ½-inch in thickness and shall be perforated by three holes per square foot of area; the diameter of the holes shall be not less than ¾-inch.

5. Monolithic stone posts shall not be used for the support of columns, girders or walls.

Idem.

279. *Stone Walls.*

1. Every stone wall shall have one header extending through the wall in every 2 feet in height and every three feet in length. Headers shall be staggered. All headers shall be good, flat stones, not less than 12 inches wide and 8 inches thick.

2. All stones shall be laid on their natural bed. No stone which does not bond into the wall at least six inches shall be used. Stones shall be firmly bedded in mortar with all spaces and joints thoroughly filled.

3. Walls built of squared stone, with dressed level beds, shall have a thickness not less than that required for brick walls under similar conditions.

4. Walls built of rubble stone shall have a sufficient increase of thickness over that specified for squared stone walls. Ruble stone walls shall not exceed three stories, or 40 feet, in height.

Idem.

280. *Ashlar.*

1. Stone or architectural terra cotta ashlar, or other approved material used for the facing of any building or structure, shall be not less than four inches thick. In stone ashlar, each stone shall have a reasonably uniform thickness, but all stones need not necessarily be the same thickness.

2. Each block of ashlar or other approved facing, shall either be bonded into the backing, or be securely anchored to the backing with metallic anchors, at least one for each 30 inches lineal length of course, and the backing, independent of facing, shall conform to the wall thickness required by this Code.

3. Where every alternate course of facing is at least eight inches thick and bonded into the backing, at least four inches, the ashlar may be counted as part of the thickness of the wall.

4. No wall faced with ashlar shall be less than 12 inches thick.

Idem.

281. *Mortar for Walls.*—Foundations, footings and parapet wall cappings shall be laid in Portland cement mortar, also arches over doorways and windows. All chimney stems shall be laid in Portland cement mortar to which 10 per cent of lime has been added. Other brick walls may be laid in lime, lime and cement, or cement mortar. Hollow block walls shall be laid in Portland cement mortar to which 10 per cent of lime has been added.

Idem.

282. *Brick Wall Thicknesses.*

1. All bearing walls shall be of sufficient thickness to support the load to be carried without exceeding the stresses herein specified, but in no case shall such walls be less than 12 inches thick, unless built of reinforced concrete.

2. The minimum thickness of all brick bearing walls shall be in accordance with the following schedules and tables. In determining the thickness of walls for varying heights, they shall be measured to the nearest tier of beams or support, whether this be a foundation, a beam, or a girder.

3. *Walls for Dwelling House Class.*—The expression, "walls for dwelling house class," shall be taken to mean and include walls for all buildings specified under Classes C and D, Section 267, as well as all other buildings used for temporary or permanent residence.

For all brick bearing walls of buildings of the dwelling house class, the upper three stories shall be not less than 12 inches thick, increasing four inches in thickness for each three stories or fraction thereof below. No three-story increment shall exceed 45 feet in height.

4. Table indicating minimum thickness of walls in accordance with above requirements:

Dwelling House Class.
Brick Bearing Walls.

Stories.	1	2	3	4	5	6	7	8	9	10
1	12	..	..	..	..	..	..	..	..	..
2	12	12	..	..	..	..	..	..	..	..
3	12	12	12	..	..	..	..	..	..	..
4	16	12	12	12	..	..	..	..	..	..
5	16	16	12	12	12	..	..	..	..	..
6	16	16	16	12	12	12	..	..	..	..
7	20	16	16	16	12	12	12	..	..	..
8	20	20	16	16	16	12	12	12	..	..
9	20	20	20	16	16	16	12	12	12	..
10	24	20	20	20	16	16	16	12	12	12

5. *Walls for Warehouse Class.*—The expression, "walls for warehouse class," shall be taken to mean and include walls for all buildings specified under Classes A, B, E, and F, in Section 267, as well as all other buildings used for similar purposes.

Excepting party and fire walls, brick bearing walls for all buildings of this class, not exceeding five stories, or 65 feet, in height, shall have the upper two stories not less than 12 inches thick, increasing four inches in thickness for each two stories or fraction thereof below. For such buildings in excess of five stories, but not exceeding ten stories, or 125 feet, in height, the top story shall be not less than 12 inches thick, increasing 4 inches in thickness for each two stories or fraction thereof below. No two-story increment shall exceed 30 feet in height.

6. Table indicating minimum thickness of walls in accordance with above requirements.

Warehouse Class.

Brick Bearing Walls.

Stories.	1	2	3	4	5	6	7	8	9	10
1	12	..	..	..	..	..	..	..	..	..
2	12	12	..	..	..	..	..	..	..	..
3	16	12	12	..	..	..	..	..	..	..
4	16	16	12	12	..	..	..	..	..	..
5	20	16	16	12	12	..	..	..	..	..
6	24	20	20	16	16	12	..	..	..	..
7	24	24	20	20	16	16	12	..	..	..
8	28	24	24	20	20	16	16	12	..	..
9	28	28	24	24	20	20	16	16	12	..
10	32	28	28	24	24	20	20	16	16	12

7. In all buildings, except dwellings, brick party walls and fire walls which serve as bearing walls on both sides, shall be not less than 16 inches thick in the upper two stories or upper 30 feet, increasing four inches in thickness for each two stories or fraction thereof below.

8. The height of a wall between lateral supports shall not exceed fifteen times its thickness unless strengthened by piers or cross walls.

9. When the clear span of a floor is greater than 25 feet in buildings of Classes A. B, E, and F, and greater than 26 feet in buildings of Classes C and D, the thickness of bearing walls shall be increased four inches over that specified in the foregoing tables for every 12½ feet or fraction thereof that the said span exceeds 25 feet for buildings of Classes A, B, E, and F, or 26 feet for Classes C and D; or shall have in lieu of this increase of thickness, equivalent piers or buttresses.

10. If any horizontal section through a bearing wall shows more than 30 per cent area of flues and openings in a wall laid up in lime, or lime and cement mortar, or 45 per cent in a wall laid up in Portland cement mortar, the said wall shall be increased a thickness of four inches for every 15 per cent or fraction thereof for which the total area of flues and openings exceed 30 per cent or 45 per cent The total area of openings and flues in any bearing wall shall not in any case exceed 60 per cent, provided that the allowable stresses shall not be exceeded.

11. In all buildings, walls 12 inches thick, and over 60 feet in length; and walls 16 inches thick which are over 100 feet in length, shall be four inches thicker throughout than is required by this Code, unless they are properly braced by cross walls, pilasters, or buttresses.

12. The thickness of non-bearing walls may be four inches less than that of bearing walls, *provided* that no non-bearing wall is less than 12 inches thick except it be of reinforced concrete.

13. In no case shall the thickness at the bottom of masonry retaining walls be less than one-quarter the height of the wall unless reinforced in an approved manner.

14. Brick or concrete walls for buildings outside the fire limits, which under this ordinance could be of wood, may have a minimum thickness of eight inches. Such walls shall not exceed two stories, or 24 feet, in height, exclusive of gables, and shall be properly braced by cross walls, piers, or buttresses, not less than 16 feet apart, and if of brick, to be laid in cement mortar with metal or other similar approved cross bonding material and no brick header bond shall be used in such exterior walls.

Idem.

283. *Panel or Enclosure Walls for Skeleton Construction.*—In skeleton construction the panel walls shall be supported by girders at each floor level, and if of brick, shall be not less than 12 inches thick, laid in cement mortar. When the vertical distance between supporting girders exceeds 15 feet the thickness of the wall shall be increased four inches for each 15 feet or fraction thereof that the said vertical distance exceeds 15 feet. Such walls shall be of brick, stone or gravel concrete, or hard burned terra cotta.

Idem.

284. *Curtain Walls.*—Curtain walls over three stories, or 50 feet, in height shall be laid in cement mortar, and shall be not less than

12 inches thick for the uppermost 50 feet thereof, or nearest tier of beams to that height, and increased four inches for every additional section of three stories, or 45 feet, or nearest tier of beams to that height. When such walls are used, the foundation of the buildings shall be so designed that the load from the columns and the load of the walls are carried together. Curtain walls shall be anchored to the steel framing at each floor level, the anchors being spaced not farther apart than six feet horizontally.

Idem.

285. *Fire Walls.*

1. Fire walls shall be built of brick laid in Portland cement mortar, or of reinforced concrete. In fireproof buildings, brick fire walls supported by girders at each story, may be 12 inches thick throughout. In non-fireproof buildings, brick fire walls which do not serve as bearing walls shall be not less than 16 inches thick in the upper four stories, or upper 50 feet, increasing four inches in thickness for each two stories or fraction thereof below. No such two-story increment shall exceed 30 feet in height. In frame buildings used for manufacturing or commercial purposes, and not exceeding two stories, or 30 feet in height, non-bearing fire walls shall be not less than 12 inches thick.

2. Every opening in a fire wall or a party wall, shall be protected on each side of the wall by an approved automatic fire door. No opening in any such wall shall exceed 80 square feet in area, except that by written permission of the Supervisor, a larger opening may be had upon the ground floor only; but special precautions shall be taken to protect such opening, and in no case shall the total width of openings in any one story, other than the first story, exceed 25 per cent in linear length of the wall. Fire and party walls shall be continuous from foundation to three feet above roof level and be coped, except that such walls in fireproof buildings need not extend above the top of the roof beams.

3. When three or more buildings used for stores, factories or warehouses, communicate by openings through separating fire walls, the openings shall be protected by double fire doors, and each building shall also be provided with a system of approved automatic sprinklers.

4. If an opening in a fire wall is made to serve as an emergency or horizontal exit, and is included in the calculations for exits, it shall not exceed 48 square feet in area, and a self-closing fire door shall be substituted for one of the automatic fire doors. The automatic door

shall be controlled by an approved automatic door release on each side of the wall.

Idem.

286. *Parapet Walls.*—All exterior or party walls over 20 feet high, except where such walls are finished as cornices, gutters, or crown mouldings, excepting also the walls of detached dwellings with peaked or hipped roofs, shall be furnished with parapets. Parapet walls shall be the full thickness of the top story walls and shall project at least three feet above the roof at all points, except that on dwellings the parapets may be reduced to two feet. All parapet walls shall be coped with approved durable material.

Idem.

287. *Hollow Building Block Walls.*

1. Hollow building blocks of hard burned terra cotta or of concrete may be used for all walls, except party and fire walls, of buildings not exceeding three stories, or 40 feet, in height, *provided* that such blocks have met the test requirements of Section 320, and are not stressed beyond the safe limits therein prescribed. The minimum thickness of such walls shall be as required for brick walls.

2. Concrete blocks shall not be used in construction until they have attained an age of 28 days, nor until they have developed the required test strength. All building blocks shall be laid in Portland cement mortar.

3. If a wall be built of blocks laid with the cells horizontal, which were designed to be normally laid with the cells vertical, or if band courses of such blocks with cells horizontal be laid in a wall otherwise built of the same blocks with the cells vertical, the carrying capacity of such walls shall be calculated from the strength of the blocks tested with their cells horizontal.

4. Hollow Terra cotta blocks in exterior walls shall be either extra hard burned or be veneered with brick, architectural terra cotta, or stone, securely bonded and set as provided in Section 277, paragraph 8, or the blocks shall be covered on the exposed surface with at least ¾-inch of Portland cement stucco; such blocks shall be well scored, grooved or roughened to retain the coating. The stucco shall not be considered as a part of the required thickness of the wall.

5. When hollow block walls, laid with cells vertical, are decreased in thickness, the blocks in the top course of the thicker wall shall be filled solidly with concrete, or the exposed openings in such top course

may be covered with slabs of hard burned terra cotta or concrete at least one inch in thickness. Terra cotta, concrete or metal slabs or templates of approved size and thickness shall be placed under all floor beams and girders as bearing plates in order that the allowable working stresses shall not be exceeded.

6. Building blocks shall be so laid that the shells and webs shall be superposed upon the shells or webs of the adjacent block or blocks below.

7. Hollow blocks when used to form lintels, which are not keyed arches, shall be reinforced with steel rods, and be filled solidly with concrete. Such lintels shall be designed in accordance with the same stresses and other requirements for reinforced concrete as required in Section 382.

8. Except for party or fire walls, hard burned terra cotta blocks may be used for walls of skeleton construction having a height not exceeding four stories, or 55 feet. The thickness shall be the same as required for brick walls.

Terra cotta blocks faced with brick bonded in the manner specified in the last half of paragraph 8, Section 277, may be used for walls of skeleton construction to a height of 10 stories, or 125 feet.

Idem.

288. *Existing Walls.*

1. Where an existing party wall is to be incorporated in a new building of skeleton or curtain wall construction, the vertical extension of the existing party wall shall be supported entirely by columns and girders and not by the party wall below, except that such existing party wall may be extended vertically to the height permitted by this Code for its existing thickness.

2. Should it be desired to increase the height of other existing party or independent walls, which are less in thickness than required under this Code, this shall be done by lining with brickwork to form a combined thickness with the old wall of not less than four inches more than the thickness required for a new wall corresponding with the total height of the wall when so increased in height. Such lining shall be supported on proper foundations and carried up to full height. All linings shall be at least eight inches in thickness, laid up in cement mortar, bonded with 4-inch by 16-inch Brick toothing projecting four inches into the old wall at least every seven feet, both horizontally and vertically, and shall be thoroughly anchored to the old brick walls with suitable wrought iron or steel anchors, placed two feet apart and

properly anchored into the old walls by through bolts or by expansion bolts set in cement or by other approved method. The anchors shall be placed in rows, alternating vertically and horizontally with each other, the old walls being first cleaned of plaster or other coatings where any lining is to be built against the same. No wall shall be lined unless in good condition.

Idem.

289. *Furred Walls and Hollow Walls.*

1. The inside four inches of all walls may be built of hard burned hollow brick, the dimensions of ordinary brick, properly tied and bonded into the walls. Terra cotta, concrete, or gypsum tile or blocks used as lining or furring shall not be considered as forming part of the required thickness of any wall.

2. In all hollow walls of stone, brick, or concrete, the same net horizontal section shall be used as if they were solid. The parts of hollow walls shall be connected by approved ties of brick, stone, or metal, placed not over 24 inches apart horizontally and vertically. Metal ties shall have the ends bent at right angles, and be not less than one inch wide by ¼-inch thick, and shall extend into the wall on each side not less than four inches.

Idem.

290. *Recesses and Chases in Walls.*

1. Recesses for stairways or elevators may be located within the required thickness of foundations or cellar walls, *provided* the walls are not thereby reduced to a less thickness than that required for a fourth story wall. Reinforcements shall be supplied where necessary to compensate for the diminished thickness.

The brick backing of recesses for alcoves and similar spaces shall be not less than eight inches thick.

2. No pipe chases shall extend into any wall more than one-third of its required thickness. No horizontal chase or recess shall exceed four feet in length in any wall.

Chases shall not be permitted within the required area of any pier. Chases or recesses in walls built of hollow blocks shall not be formed by cutting of blocks, or by other method which would impair the strength of the wall.

Neat fitting metal sleeves, or asbestos covering, shall be provided around pipes at each floor level, and the chases at these levels shall be filled with solid masonry for the space of one foot in height.

Idem.

291. *Arches and Lintels.*

1. Openings for doors and windows shall have arches or lintels of masonry or metal, which shall have a bearing at each end of not less than 6 inches on the wall. Bearing plates shall be provided for lintels resting on walls where the span is more than 6 feet. Tie rods shall be used in all arches where necessary to resist the thrust, and when steel or metal is used for lintels it shall be so arranged as to support the entire thickness of the wall.

2. On the inside of openings less than 4 feet in width in walls of non-fireproof buildings in which lintels or arches may be less than the thickness of the wall to be supported, timber segments may be permitted which shall rest at each end not more than 2 inches on any wall, and be cut to serve as center for a rowlock or keyed arch. Brick arches 5 feet wide and under shall not be less than 8 inches high.

Idem.

292. *Walls of Unfinished Buildings.*—Any building, the erection of which was commenced in accordance with specifications and plans submitted to and approved by the Supervisor prior to the passage of this Code, if properly constructed, and in safe condition, may be completed or built upon in accordance with the requirements of law as to thickness of walls in force at the time when such specifications and plans were approved.

Idem.

PART X.

Heights and Areas.

293. *Heights of Buildings.*

1. No building or structure hereafter erected, except church spires, water towers, smoke stacks or chimneys, shall exceed in height two and one-half times the width of the widest street upon which it fronts, nor shall it exceed the following limits.

	Height in Stories.	*Height in feet.*
Frame buildings used for purposes other than dwellings and tenements	2	30
Frame dwellings and tenements occupied by not more than two families	2½	30

Frame dwellings occupied by not more than one family	3	35
Frame dwellings having bearing walls of hollow terra cotta or concrete blocks	3	40
Non-fireproof buildings, ordinary construction	4	55
Non-fireproof buildings, mill construction	5	65
Fireproof buildings used for factories, stores, warehouses or workshops	7	85
Fireproof buildings used for purposes other than factories, stores, warehouses or workshops	10	125

2. If a single story building exceeds 30 feet in height the roof shall be constructed entirely of incombustible materials, and all metal framework of same shall be protected with fireproofing, except as provided in Section 267, paragraph 2.

3. A single story building not exceeding 30 feet in height may have a roof monitor not exceeding 10 feet in height.

4. No story of any building above the first story shall exceed 15 feet in height.

Idem.

294. *Allowable Floor Areas.*

1. In every building of the character named in this section the maximum area of any floor between fire walls or exterior walls, either without or with a full equipment of automatic sprinklers, shall be as follows:

2. *Non-Fireproof Construction.*

(a) Tenement houses, 3,000 square feet.

(b) All other ordinary non-fireproof buildings, height not exceeding 55 feet.

Fronting on	*Without Sprinklers.*	*With Sprinklers, increase of 66 2/3 per cent*
One street	5,000 sq. feet	8,333 sq. feet
Two streets	6,000 sq. feet	10,000 sq. feet
Three or more streets	7,500 sq. feet	12,500 sq. feet

(c) Mill construction buildings, height limit, 65 feet.

Fronting on	*Without Sprinklers.*	*With Sprinklers, increase of 100 per cent.*
One street	6,500 sq. feet	13,000 sq. feet
Two streets	8,000 sq. feet	16,000 sq. feet
Three or more streets	10,000 sq. feet	20,000 sq. feet

3. *Fireproof Construction.*

(a) All buildings of Classes A, B, C, and D; light and power stations; office buildings: No restrictions as to area.

(b) All other buildings not exceeding 65 feet in height.

Fronting on	*Without Sprinklers.*	*With Sprinklers, increase of 66 2/3 per cent.*
One street	10,000 sq. feet	16,666 sq. feet
Two streets	12,000 sq. feet	20,000 sq. feet
Three or more streets	15,000 sq. feet	25,000 sq. feet

(c) Stores, warehouses, factories and workshops not exceeding 85 feet; and other buildings not exceeding 125 feet in height.

Fronting on	*Without Sprinklers.*	*With Sprinklers, increase of 50 per cent.*
One street	7,500 sq. feet	11,250 sq. feet
Two streets	10,000 sq. feet	15,000 sq. feet
Three or more streets	12,500 sq. feet	18,750 sq. feet

(d) The first floor only of any fireproof building occupied as a store may have an area of 20,000 sq. ft., and if fully protected by approved automatic sprinklers may be increased 50 per cent. or have a maximum area of 30,000 sq. ft.

Idem.

PART XI.

Allowable Loads.

295. *Floor Loads.*

1. Each floor of every building shall be of sufficient strength in all its parts to bear safely the weight to be imposed thereon, in addition to the weight of the floor itself. It shall safely support a mimimum live load per square foot of area as specified in the following table:

Class of Building	Live Loads. Pounds per square foot. Ground and Lower Floors.	Upper Floors.
Foundries, light and power plants, printing and lithographing houses, railroad freight depots	250	250
Warehouses	200	200
Car barns, garages	150	120
Fire houses	150	60
Armories, ball rooms, dance halls, exhibition buildings, factories, gymnasiums, workshops, lofts, markets, stables, stores, public halls, restaurants	120	120
Railway passenger stations	120	90
Office buildings	120	75
Court Houses	100	100
Churches, libraries, museums, theatres	90	90
Schools and colleges	90	75
Asylums, bath houses, club houses, detention buildings, dormitories, hospitals, hotels, lodge rooms, lodging houses, studios	90	60
Tenement houses and dwellings	60	40

2. Any floor beam in a building of Class E shall be capable of sustaining a live load at its center of at least 4,000 pounds.

3. No safe shall be placed on a stair landing or in a stair hall, nor shall its weight be carried by any beam which also carries the floor of any stair landing or stair hall.

Idem.

296. *Roof Loads.*—Every roof with a pitch of less than 20 degrees with the horizontal, shall be proportioned to bear safely a live load of 30 pounds per square foot of surface. If the pitch be more than 20 degrees, the live load shall be assumed to be 20 pounds per square foot measured on a horizontal plane.

Idem.

297. *Column Loads.*

1. Every column, post or other vertical support shall be of sufficient strength to bear safely the combined live and dead loads transmitted to it.

2. In buildings more than five stories in height, the following reductions are permissible: For columns supporting roof and top floor, no reduction; for columns supporting each succeeding floor, a reduction of 5 per cent. of the total live load per floor may be made, but the total deduction shall not exceed 50 per cent.

3. No reduction of live load on columns shall be permitted in buildings where the assumed floor load is more than 120 pounds per square foot and is likely to be permanent in character as in warehouses, printing houses, machine shops, etc.

4. For structures carrying machinery, such as cranes, conveyors, printing presses, etc., at least 25 per cent shall be added to the stresses from live loads to provide for effect of impact and vibrations.

Idem.

298. *Sidewalk Loads.*—For sidewalks between the curb and building lines, live loads shall be taken at 500 pounds per square foot or a concentrated load of 5 tons at any point.

Idem.

299. *Strength of Existing Floors to be Computed.*—In every existing building of Classes E and F, erected and occupied before the adoption of this Code, the weight that each floor will safely sustain shall be computed by a competent person employed by the owner or occupant. Such computations shall be filed with the Supervisor with an affidavit by the person making the same, in such manner as the Supervisor may direct, and shall give full information on which the computations are based. When the safe live loads on any existing floor thus ascertained has been approved by the Supervisor he shall post one or more copies of such approved live load in such conspicuous place or places on each story as may be designated by the Supervisor and no floor shall be loaded in excess of the safe allowances mentioned in said posted copy.

Idem.

PART XII.

Means of Egress.

300. *Number and Width of Exits and Doors.*

1. Every building, except dwellings, and every story in each building above the first, shall have at least two means of exit remote

from each other; one of these shall open to a street or fireproof passage leading to a street, and one may open to a yard or other space deemed safe by the Supervisor and of sufficient area to accommodate all persons in the building. Two means of exit remote from each other shall be provided from each story of dwellings when over 2 stories in height.

2. In every building except buildings of Class D, all required exit doors in the first story, including the doors of vestibules, shall open outwards. *Provided* this requirement shall not prohibit the use of doors which swing both inwards and outwards, nor of sliding or rolling doors in stables, garages,storerooms, and the shipping and receiving rooms of manufacturing, mercantile and industrial buildings, where conditions make such necessary.

3. When exit doorways have a clear width of at least 40 inches each, the aggregate widths of such doorways shall be equal to the required width of corridor or stairway served by same. When individual doors are less than 40 inches wide, there shall be one doorway for each 22 inches of required width of corridor or stairway leading to same. Every doorway shall be at least 35 inches wide in the clear. All passageway exit doors shall swing in the direction of exit travel, except in case of horizontal exits where direction of travel may be indeterminate.

4. The opening of one door shall not be permitted to obstruct another, and the arc of opening of doors which open upon stairway landings or platforms shall not reduce the width of the passageway to less than the required width of the stairs.

5. Every room having an occupancy of more than 75 persons shall have at least two doorways not less than 5 feet in the clear remote from each other leading to exits.

6. Hallways or corridors at the street or court level furnishing exit from stairways, shall be not less in width than the aggregate width of the required stairways which they serve. Every hallway or corridor which may serve as an exit for 50 or more persons, shall have at least 60 inches of width for the first 50 persons and 12 inches additional for each additional 50 persons to be accommodated thereby. This computation shall be based on the number of persons in the story having the largest occupancy served by said corridor and kept free from obstructions of any character.

7. At all times when any loft or space is occupied for manufacturing or mercantile purposes, the fastenings or locks on exit doors shall be such as may be easily opened from the inside without the use of keys.

8. A metal and glass box using green glass marked "EXIT" in letters not less than 6 inches in height and body of letters 1 inch wide, shall be placed over all exits in the above specified buildings. The elevators shall be provided with similar signs marked "ELEVATOR." Such signs shall be illuminated when necessary by means of artificial lighting. The color of such letters shall be green.

9. Elevators, escalators and revolving doors shall not be considered in calculating exit requirements excepting such revolving doors as are automatically collapsible.

10. Entrances and doors in tenement houses, theatres, motion picture theatres, and places of public or private entertainments, shall be as elsewhere provided in this Code.

Idem.

301. *Stairs and Stairways, Construction of.*

1. All buildings which are used above the first floor for manufacturing or business purposes, or for public assemblage, or for any purpose whatever if five stories or more, or 60 feet high, except armories, courthouses, dwellings, fire houses, jails, libraries, museums, police stations, prisons, railway stations and similar buildings, shall preferably have the required stair shafts separately and continuously enclosed, as specified in Sections 353 and 356. In fireproof buildings all stairs, platforms, landings, and stair hallways, including the flooring, shall be of fireproof construction. Storage of combustible material is prohibited within the stairway enclosure.

2. All stairs, platforms, landings, balconies and stair hallways, shall be of sufficient strength to sustain safely a live load of not less than 100 pounds per square foot for interior construction, and 150 pounds per square foot for exterior construction, with a factor of safety of 4 in each case; and except in dwellings shall conform to all the requirements of this section as to hand rails, newels, landings, widths, exits, and prohibition against winding treads. The space beneath any stairway built in whole or in part of combustible material shall be left entirely open or be completely enclosed without door or other opening.

3. No stories in any building shall be connected by an open shaft or stairway except dwellings and buildings mentioned in paragraph 1; also theatres as provided in Section 489.

4. Stairways used as required means of exit shall be at least 48 inches wide between faces of walls, or 44 inches wide between face of wall and an open balustrade, or between two open balustrades.

All such widths shall be clear of all obstructions except that hand rails attached to walls may project not more than 3½ inches within them. If newels project above tops of rails, a clear width of at least 44 inches shall be provided between the faces of the newel and the face of the wall or newel opposite. All stairs shall have walls or well secured balustrades or guards on both sides, and except in dwellings, shall have hand rails on both sides. A stairway of 7 feet or more in width shall be provided with a continuous intermediate hand rail substantially supported. All stairs shall have treads and risers of uniform width and height throughout each flight; the rise shall be not more than 7¼ inches, and the tread exclusive of the nosing not less than 9½ inches. Stairways exceeding 12 feet in height shall have an intermediate landing.

Buildings in which there may be a congregation of people for civic, political, educational, religious or amusement purposes, except as provided for theatres in Section 486 and in those used for the care or treatment of persons, all stairs exceeding 8 feet in height shall have an intermediate landing. All landings shall be at least 3 feet in length.

5. No arrangement of treads known as winders shall be permitted in required stairways between the level of the top floor and the street.

6. Whenever the treads or landings are of slate, marble, stone, or composition, they shall be supported for their entire length and width by a solid metal plate at least ⅛-inch thick, securely fastened. If stairs are of incombustible material, other than metal, and treads and landings are each solidly supported for their entire length and width by masonry, metal supports for treads may be omitted.

7. All stairways that serve as required means of exit for one or more of the upper four stories of every building shall be continued their full width to the roof, and shall lead by a direct line of travel to the first story, and open directly on the street, or to an open-air or fireproof passage leading to the street, or to a yard or court connected with the street. Such fireproof passage shall be not less than 7 feet in height.

8. The continuity of all stairs which may be used for exit purposes, shall be interrupted at street level by partitions or doors or other means which will indicate the main floor level and make clear the direction of egress to the street.

9. Every enclosed stairway shall be provided with an adequate system of lighting, arranged to insure reliable operation when through accident or other causes the regular lighting is extinguished.

10. All required stairways shall be constructed in one of the following three ways, and shall be known as stair exits:

(b) *Smokeproof Tower.*—The stairs, landings, and balconies or platforms, shall be solid and completely enclosed as required for interior stairways in Section 353 and shall extend from the sidewalk, court, or yard level to and above the roof to form a bulkhead. There shall be no openings in any wall separating the stairway from the building, but fixed or automatic fire-windows sufficient for lighting purposes are not objectionable in the extreme walls, *provided* they are not subject to fire exposure hazard from the same or nearby buildings. Access shall be provided to the stairway from every story of the building by outside balconies of steel or masonry, or by vestibules within the walls of the building but open on at least one side. Every such balcony or vestibule shall have an unobstructed width of at least 44 inches, and shall open upon an open space not less than 100 square feet in area. The balcony or vestibule shall be provided with a solid incombustible floor. Railings of steel, or other approved incombustible material, shall be provided not less than 4 feet high. Access to the balcony or vestibule from the building and to the stairways from the balcony or vestibule shall be by approved self-closing fire doors not less than 40 inches wide and 7 feet high, which shall swing in the direction of exit travel. The doors shall be provided with locks or latches with visible fastenings requiring no keys to open them. A wired glass panel shall be provided in the door opening into the stair shaft of not less than one-third its area. The level of the balcony or vestibule floor shall be not more than 7¾ inches below the door sill of the building. Landings in such stairways shall be of a width that the doors in opening into the stairway shall not reduce the free passageway of the landing to a width less than the width of the stairway.

Idem.

302. *Fire Escapes.*—Every building, except as herein provided, now or hereafter used in whole or in part, as a public building, public or private institution in which persons assemble, work, room, lodge or sleep above the second story, shall be provided with a proper number of outside fire escapes for the use of all persons accommodated, assembled, employed, lodged or residing in such building; each fire escape shall be kept free from obstruction and in good repair, and ready for use at all times, and shall have such hallways and approaches on each story as shall be necessary, and where practicable the platforms shall be placed at or just below the floor levels.

Such fire escapes shall consist of outside iron balconies at each floor above the first floor, and stairways, connecting said balconies to the ground where the fire escape projects over a public highway, a balanced flight shall connect the lower balcony to the ground in a manner hereinafter specified, (or an intermediate platform not less than 9 feet above sidewalk or grade with an iron ladder extending to within 7 feet of grade may be used if approved by the Supervisor.) Stairway flights shall be placed on a slope not steeper than a ratio of one horizontal to one and one-quarter vertical. The balcony on the top floor shall be provided with a goose neck ladder leading from said balcony to above the roof and secured to same.

Balconies shall be not less than 3 feet 6 inches in width, and shall extend not less than 8 inches each side of the clear opening of window or windows opening on said balcony. Platforms or landings at head or foot of stair flights shall not be less than 24 inches by 36 inches in area. All balconies and platforms shall be designed, constructed and erected to sustain a uniform live load of not less than 60 pounds per square foot, in addition to their own weight.

At least one window and, if feasible, not less than two windows of each part of a building separated by inside walls shall open onto balconies. All windows or doors opening upon a balcony shall be of easy access and at the level of balcony floor, of sufficient size to permit of easy passage through them, and of fire proof construction (using approved wired glass where necessary) and such doors and windows shall open outward in double door fashion where possible. All such doors, windows, platforms and stairways shall be kept free from all obstructions.

Stairway flights shall not be less than 20 inches in width and shall be designed, constructed and erected to safely carry a live load of not less than 150 pounds per step with the exception of the treads which shall be designed to carry a live load of 200 pounds concentrated at the center of tread.

Treads shall not be less than 7 inches in width, and the rise of each step shall not exceed 9 inches. A clear distance of not less than 20 inches shall be left between the stairway and wall of building. Stairway openings in platforms, landings or balconies shall be of sufficient size to provide a clear headway of at least 6 feet, 6 inches, and shall not be less than 21 inches in width, such openings shall not be covered over in any way.

All balconies, platforms, landings and stairways shall be provided with substantial hand railings, such railing to be not less than

36 inches nor more than 42 inches high, well secured and braced at wall and posts, with posts spaced not more than six feet apart.

Brackets supporting fire escapes shall be placed at all points where stairs connect, at or near ends of balconies and at intermediate points not further apart than 8 feet. Brackets shall be securely fastened to wall at top with ¾ inch bolts going entirely through the wall with washers on inside of wall, and at the bottom with ¾ inch expansion bolts. On new buildings, all brackets shall be set as the walls are being built.

All steel, wrought iron, and cast iron members shall be designed in accordance with the allowable working stresses specified in this Code. No steel or wrought iron less than ¼ inch in thickness shall be used (excepting webs of channels and beams) and no angles less than 2x2x¼-inch, or bars less than 1½x¼-inch will be acceptable. Strings shall be made of not less than 6-inch steel channels or other shapes equally as strong.

When a fire escape projects over a street or other public highway a properly balanced flight shall be required to connect the lower balcony with a safe landing place. Should the balcony be more than 16 feet above the sidewalk or ground an intermediate landing shall be provided. Such landing shall be located not less than 9 feet above the sidewalk or ground and shall be connected with the balcony above by means of a stairway constructed as herein specified.

The balance flight shall be made as specified for other flights, well braced, pivoted and properly balanced to stand at a horizontal position without danger to passersby.

Idem.

303. All parts of fire escapes shall be painted not less than 2 coats of paint, one coat at the shop and another coat after erection, and shall be painted thereafter whenever needed.

Idem.

304. The Supervisor of Buildings or his assistant shall have power to make and have served an order in writing upon any owner or owners, lessee, or agent of any building coming under the provisions of this ordinance, ordering that one or more fire escapes shall be erected on the said building, or ordering that a fire escape already erected shall be changed in such manner as he shall designate in order to conform to the provisions of this ordinance.

Idem.

305. Any corporation, firm or person failing or neglecting to obey such order within thirty days from the date of issue of said order, shall be liable to a penalty fine as herein provided, and each day elapsing thereafter until the fire escape shall have been erected on said building in compliance with said order shall constitute a separate offense subject to the penalty fine herein designated.

Idem.

306. Smoke-proof towers with fire-proof stairways therein, approved by the Supervisor, shall be considered as meeting the requirements of this ordinance.

Idem.

307. An "Exit-to-fire-escape" box sign, with green glass letters not less than 3 inches high on face and an electric light within, shall be placed at the entrance to fire escape on each floor of every building having fire escapes. Such signs shall be kept lighted all and every night when people are rooming or sleeping within, or during the entire time people are congregated within such building.

Idem.

308. *Requirements for Exits and Stairways.*

1. Every building hereafter erected, and every building altered or converted to increase its occupancy, excepting dwellings, tenement houses, theatres, and assembly halls, which are elsewhere provided for, shall have exits and stairways as required in this section.

2. (a) The term floor area in this section shall mean the entire space in a given story between exterior walls, fire walls or fire exit partitions, except that in computing such area the space occupied by walls, partitions, columns, and all shafts may be excluded.

(b) The term stair exit in this section shall be as required in paragraph 10, section 301.

(c) The term horizontal exit shall be understood to mean one or more openings through or around a fire wall, fire exit partition, or any wall separating two buildings; no such opening shall be less than 30 inches wide: Or such an exit may be an exterior bridge or balcony connecting two buildings or two floor areas of the same building. Where there is a difference in level between connected buildings or floor areas, gradients shall be provided of not more than 1 foot in 6 feet where practicable. The bridges or balconies shall be not less than 44 inches wide, and shall be constructed of incombustible material, and enclosed on the sides at least 4 feet high. All exterior exposing openings in connected buildings or floor areas within 10

feet of bridge or balcony shall be protected by fire doors or fire windows with fixed or automatic sash. The floor of a bridge or balcony shall be not more than 7¾ inches below the door sill opening upon it; the connecting floor within the building shall be not more than 1 inch below the sill. Every such bridge or balcony when enclosed shall be provided with means of lighting.

All horizontal exits shall be provided with self-closing fire doors. Such doors shall be kept unlocked during the occupancy of any portion of the floor areas or connected buildings. No glass shall be used in such doors when used on exits through fire walls as provided in Section 285, paragraph 4. Wired glass may be used in doors in other horizontal exits provided it conforms to the requirements of Section 285, paragraph 4.

The available floor area on each side of a horizontal exit shall be sufficient for the joint occupancy on the basis of not less than 3 square feet of unobstructed space per person and shall be provided with at least one stairway as defined in Section 301.

3. (a) In all buildings not exempted in paragraph 1 of this section, one of the two required means of exit from every floor area above the first floor shall be a stair exit, and the other may be a stair exit or a horizontal exit. No part of any floor area above the first floor, excepting buildings of Class F, shall be more than 100 feet distant from an entrance to one such means of exit.

When a building over 35 feet in height is occupied for business purposes on the lower floors and for the home of not more than two families on the floors above, at least one continuous enclosed stairway shall be provided to the street level through the stories occupied for business.

(b) In buildings of Class E, over 55 feet high, except office buildings, one of the two required means of exit shall be either a smokeproof tower or an interior enclosed stairway with self-closing doors opening into hallways which are also enclosed with fireproof partitions as specified in Section 309, paragraph 1.

(c) In every building over 90 feet in height one of the required means of exit shall be a smokeproof tower or a horizontal exit as herein defined.

4. In determining the occupancy of any building, the width of stairways required for any floor area above the first floor shall be determined by the number of persons occupying such floor area, computed on the basis of fourteen persons for each 22 inches width of stairway, plus one person for every 3 square feet of hallway floor and

stairway landings in the story height of such floor, excepting that in any building where a system of automatic sprinklers is installed throughout the entire building, as required in Section 460, the number and width of stairways may be computed on the basis of twenty-one persons for each 22 inches width of stairway; and excepting that when horizontal exits are provided as required in paragraph 2 (c) of this section, the number and widths of required stairways for floor areas above the first floor may be diminished to a basis of fifty persons for each 22 inches width of horizontal exit, *provided* that in no case there shall be less stairway or means of exit than required in paragraph 3, (a) and (b) of this section.

5. Exits shall also be provided from the cellar, basement, and first story of every building as may be required by the Supervisor of Buildings.

6. The number of exits and stairways in tenement houses shall be as required in the Tenement House Law, Sections 597 and 603.

Idem.

309. *Fire Exit Partitions.*

1. Partitions, erected to furnish horizontal exits, shall be built of fireproof materials. No construction shall be used for such partitions less than 5 inches thick, unless it has been approved after a fire test as prescribed in Section 439, paragraph 4; in no case shall such partition be less than 4 inches thick if of block or tile construction, or less than 3 inches thick if of reinforced concrete or solid metal lath and cement plaster construction, except as herein permitted for non-fireproof buildings.

When tile or block partitions are less than 5 inches thick, substantial protected reinforcement shall be provided at intervals not exceeding 20 feet in length to resist the effect of buckling due to heat.

2. Fire exit partitions shall be supported at each floor, and shall be securely anchored to the walls, floor, and ceiling of the rooms which they subdivide. In fireproof buildings such partitions shall rest upon the fireproofing of the floor.

3. In non-fireproof buildings fire exit partitions shall be not less than 3 inches thick if of block or tile construction, and not less than 2½ inches thick if of reinforced concrete or solid metal lath and cement plaster construction, and shall be continuous through all stories of the buildings and be placed one above the other. The space between floor joists included between the top of a partition in one story, and the bottom of the corresponding partition in the story above, shall be completely fire-stopped with incombustible material.

4. Doorways in fire exit partitions shall be not more than 60 feet apart, but doorways may be omitted if approved means of exit around the partitions are provided. No openings other than doorways protected by fire doors, shall be placed in such partitions except that fire windows not exceeding ½ of 1 per cent. of the area of the partition may be permitted where strictly necessary for purposes of observation. Such fire windows shall have fixed sash and may be placed either in the partition itself or in the doors. Windows placed in partitions shall also be protected by automatic closing fire shutters. No single pane shall exceed 144 square inches in area, and not more than one pane shall be placed in a door.

5. Wired glass panels not exceeding 720 square inches in area are permitted in doors of fire exit partitions in corridors of hotels, clubs, dormitories and similar buildings.

Idem.

310. *Exits and Protection for Existing Buildings.*

1. Where the exit facilities of existing buildings are found by the Supervisor to be inadaquate, additional exits, sprinklers, or other protection shall be provided of approved types.

2. In case the Supervisor may have declared an existing building unsafe, and ordered increased exit facilities, sprinklers or other protection, appeal may be made from such order to the Board of Appeals as provided in Section 250. The decision of that Board shall be final, and when it has been complied with, the Supervisor shall issue a certificate to accord with such decision.

Idem.

311. *Engineers' Stationary Ladders.*—Every building in which high-pressure steam boilers are placed in the cellar or lowest story shall have stationary iron ladders or stairs from such story leading direct to a manhole through the sidewalk or other outside exit in addition to another approved means of entrance and exit.

Idem.

PART XIII.

Tests, Quality and Weights of Materials.

312. *Strength Test Requirements.*

1. All building materials shall be of a quality to meet the requirements of this Code, and such tests as are required by the Super-

visor shall meet the test specifications promulgated by him in accordance with the requirements.

2. All tests shall be conducted under the supervision or direction of the Supervisor. Laboratory tests shall be made at some Testing Laboratory of recognized standing by a reputable, competent, and disinterested expert acceptable to the Supervisor. The tests shall be at the expense of the owner or builder. The test certificate shall state the source of the test specimens, the method of test, and the results obtained. Original signed copies of the certificates shall be furnished the Supervisor and shall be kept on file in his office subject to public inspection.

The Supervisor may at his discretion accept certified reports of tests made by responsible persons, *provided* such reports show that the materials, appliance or method of construction have met the test requirements of this Code.

4. Materials, appliances or methods of construction which have been tested and approved shall be used and installed in the same manner in which they were tested for approval.

5. Additional tests shall be made from time to time at the discretion of the Supervisor.

Idem.

313. *Brick.*

1. All bricks used in buildings, shall be sound, hard burned, or other approved brick of regular shape. Second-hand brick shall be thoroughly cleaned before being used. Not more than 15 per cent. shall be bats or broken brick.

2. Brick tested for approval shall develop an average strength of 3,000 lbs. per square inch, and no sample shall fall below 2,000 lbs, per square inch. Brick shall be tested flatwise (half bricks permitted), and the average shall be taken on at least five samples. The average allowable absorption shall not exceed 15 per cent.

Idem.

314. *Sand or fine aggregates.*—The sand or fine aggregates shall consist of sand, crushed stone, or gravel screenings passing (when dry) a screen having 4 meshes to the lineal inch, *provided* not more than 10 per cent. shall pass a screen having 100 meshes to the lineal inch. It shall be cleaned, coarse, of hard durable materials and shall contain not more than 5 per cent. of loam or other deleterious matter.

Idem.

315. *Lime.*

1. Slacked lime (lime putty) shall be made from well-burned quick lime, free from ashes, clinker and other foreign material. All lime to be slaked not less than 3 days before using.

2. Dry hydrated lime shall be the finely divided product resulting from mechanically slaking pure quick lime at the place of manufacture.

3. Lime shall be of quality to meet the specifications of the American Society for Testing Materials.

Idem.

316. *Lime Mortar,*—Lime mortar shall be made of one part by volume of slaked lime (lime putty), or dry hydrated lime, and not more than four parts by volume of sand.

Idem.

317. *Cements.*—Portland cement and Natural cement shall meet the respective requirements of the current Standard Test Specifications of the American Society for Testing Materials for those cements. No caked or lumpy cement shall be used.

Idem.

318. *Cement Mortar.*

1. Cement mortar shall be made of cement and sand in the proportions of one part of cement and not more than three parts of sand by volume to which not more than 10 per cent. of hydrated lime or lime putty may be added.

2. Except in chimneys, not more than 15 per cent. of the cement by volume may be replaced by an equal volume of dry hydrated lime. The lime and cement shall be thoroughly mixed before the addition of water. The mortar shall be used immediately after water is added.

3. Cement-lime mortar shall be made of one part of cement, one part of slaked lime or dry hydrated lime, and not more than three parts of sand to each. All materials to be measured.

Idem.

319. *Gypsum Mortar or Plaster.*—A mortar or plaster composed of 1 part retarded gypsum, and not more than 3 parts sand, with binding material when necessary.

Idem.

320. *Building Blocks.*

1. The term "block" as used in this section shall mean any shape of block, brick, or tile which forms a hollow or cellular wall.

2. Terra cotta blocks for bearing walls shall be dense, and hard-burned or vitreous.

Portland cement only shall be used in the manufacture of concrete blocks, and the coarse aggregate shall be of suitable material graded in size, but in no case shall the maximum dimension exceed one-half the width of the minimum section of the finished block.

3. All building blocks used for bearing walls shall be marked or branded for identification and such marks or brands shall be registered with the Supervisor. No make of blocks shall be used in any structure until the requisite number of samples have successfully met the test requirements of this section, and have been approved by the Supervisor.

Tests may be made to establish the working stresses to govern the use of blocks of each particular mark or brand. A series of ten full size blocks may be selected by the Supervisor from average quality stock, either at the factory, or from stock delivered for use at a building, and shall be tested for compression.

4. Concrete blocks shall be not more than 36 days old when tested.

5. The compressive strength of building blocks shall in all cases be calculated upon the gross sectional area of the bedding faces, including the cellular spaces.

All blocks submitted to test shall be bedded in plaster of paris or cement to secure an even bearing.

Two-piece blocks shall be tested in pairs as set to form the two faces of the wall. The strength requirement shall be the same as the hollow blocks, and it shall be calculated upon the gross sectional wall area which would be formed by the two blocks and the space between them.

6. The average ultimate compressive strength for terra cotta blocks designed to be normally laid with the cells vertical, and which are tested with the cells in this position, shall be not less than 1,200 lbs. per square inch. The allowable working stress on such blocks shall not exceed 120 lbs. per square inch.

7. The average compressive strength of terra cotta blocks which are designed to be normally laid with the cells vertical, but are tested with the cells horizontal, shall be not less than 300 lbs. per square

inch, and no block of the set shall test less than 200 lbs. per square inch. The allowable working stress on such blocks when laid with the cells horizontal, shall not exceed 30 lbs per square inch.

8. The average ultimate compressive strength for terra cotta blocks designed to be normally laid with the cells horizontal, and which are tested with the cells in that position, shall be not less than 800 lbs. per square inch. The allowable working stress on such blocks shall not exceed 80 lbs. per square inch.

9. The average compressive strength for concrete blocks when tested with the cells vertical, shall be not less than 800 lbs. per square inch, and 300 lbs. per square inch with no block testing at less than 200 pounds per square inch if tested with the cells horizontal. The allowable working stress for such blocks shall not exceed 80 lbs. and 30 lbs. per square inch respectively.

10. Hollow building blocks may be filled solidly with Portland cement concrete or cement mortar to increase the stability and to aid in distributing the load, but the allowable working stress on such blocks shall not be greater than that permitted for unfilled blocks.

11. The absorption of building blocks used for bearing or panel walls, determined by taking the average test of three blocks shall not exceed 10 per cent. in 48 hours, and shall not exceed 15 per cent. in any case.

12. Hollow building blocks shall not be used in fireproof buildings until they have successfully withstood a two-hour fire test as specified for partitions in Section 439, paragraph 4.

Idem.

321. *Terra Cotta Floor Tile.*—Terra cotta floor tile, when tested on end and faced with Portland cement, shall give an average compressive strength of not less than 2,500 lbs. per square inch of net area. The average strength shall be computed from the results of test of ten average tile.

Idem.

322. *Concrete.*

1. All mass concrete shall consist of a medium wet or plastic mixture of cement, sand, and stone, gravel or hard durable material, of such proportions or quality as shall be specified by this Code.

2. All concrete shall be mixed, deposited and protected as required for reinforced concrete in Sections 419-421.

3. All forms and centering shall be built plumb and to true lines in a substantial manner, with joints sufficiently tight to prevent the leakage of the cement mortar. They shall be properly supported and braced to safely sustain both the dead load and the live load that may be placed upon them during construction.

4. All tests on concrete shall be made in accordance with the requirements of Sections 312 and 385 but the test strength of concrete other than that used with reinforcement shall be as specified by the Supervisor.

Idem.

323. *Structural Timber.*—All timbers and wooden beams used in building shall be of good sound material, free from rot, large and loose knots, shakes, or any imperfection whereby the strength may be seriously impaired. And the recognized standards and rules of the Southern Pine Lumber Association shall be the standard of requirements by this Code.

Idem.

324. *Structural Steel and Iron.*

1. All wrought and cast structural steel and iron shall conform to the test requirements of the current Standard Specifications of the American Society for Testing Materials.

2. Rivet steel shall have an ultimate strength of 46,000 to 56,000 lbs. per square inch.

3. All other structural steel shall show an ultimate strength of 55,000 to 65,000 lbs. per square inch.

4. No second-hand rolled shapes shall be used in any structure without the written permission of the Supervisor.

5. Steel castings shall be made from open hearth steel of soft or medium grade, and shall be practically free from blowholes, with a reasonably clear skin and sharpness to pattern, and shall show an ultimate tensile strength of 60,000 to 70,000 lbs. per square inch.

6. Cast iron shall be of good foundry mixture, producing a clear, tough, gray iron. Castings shall be free from serious blowholes, cinder spots, and cold shuts. Transverse tests on cast iron shall be made upon the 1¼-inch diameter "Arbitration Bar" of the American Society for Testing Materials. The bar to be supported on 12-inch centers, loaded at the middle, and in no case shall it test at less than 2,000 lbs. Tensile tests optional.

Idem.

325. *Weights of Materials.*—The weights of various materials shall be assumed to be as follows:

	Pounds per cubic foot
Brickwork—Ordinary	120
Brickwork—Pressed brick	130
Concrete—Cinder, used for floor arches or slabs, well tamped	108
Concrete—Cinder, used for filling, not tamped	60
Concrete—Stone, or gravel	150
Granite, Bluestone and Marble	170
Limestone	160
Sandstone	145
Oak	50
Spruce and Hemlock	30
White Pine	27
Yellow Pine, Grade I (see Section 327, paragraph 4)	42
Yellow Pine, Grade II	35
Maple	43
Birch	45
Douglas Fir and Cypress	35

Idem.

PART XIV.

Working Stresses.

326. *Computations for Working Stress.*

1. The required dimensions of each piece of material and of each form of construction to be used in buildings shall be computed, according to the rules prescribed by this Code.

2. Factors of Safety. Where the Code furnishes neither a unit working stress, nor a factor of safety for a material, the relation of allowable working stress to ultimate strength shall be determined by the Supervisor if necessary.

Idem.

327. *Permissible Working Stresses.*

1. The safe carrying capacity of the various materials of construction, when not otherwise specified, shall be determined by the following working stresses in pounds per square inch of sectional area:

2. *Steel and Iron.*

Compression in Short Blocks.	*Pounds per square inch.*
Rolled Steel	16,000
Cast steel	16,000
Cast iron	16,000
Steel pins, shop and power driven field rivets, (bearing)	24,000
Steel field rivets (driven by hand) (bearing)	20,000
Steel field bolts (bearing)	16,000

TENSION.

Rolled steel	16,000
Cast steel	16,000

SHEAR.

Steel web plates	10,000
Steel shop and power driven field rivets and pins	12,000
Steel field rivets (driven by hand)	10,000
Steel field bolts	8,000
Cast steel	9,000
Cast iron	1,500

EXTREME FIBRE STRESS.

Rolled steel beams, and riveted steel beams	16,000
Rolled steel pins, rivets, and bolts	24,000
Cast iron compression side	16,000
Cast iron tension side	2,500

COMPRESSION.

3. *Concrete and Masonry.*

Grout, Portland cement, neat	1,000
Grout, Portland cement, neat between steel in foundation not over ½ inch	1,500
Concrete, Portland cement, 1; sand 2; stone 4	500
Concrete, Portland cement, 1; sand 2½; stone 5	400
Concrete, Natural cement, 1; sand, 2; stone 4	125
Concrete, Natural cement, 1; sand, 2½, stone 5	80
Brickwork in Portland cement mortar	250
Brickwork in natural cement mortar	208
Brickwork in lime and Portland cement mortar	208
Brickwork in lime mortar	110

Hollow terra cotta blocks, see Section 320.	
Hollow concrete blocks, see Section 320.	
Rubble stonework in Portland cement mortar	140
Rubble stonework in lime and cement mortar	100
Rubble stonework in lime mortar	70
Cut stone masonry, other than sandstone	600
Sandstone masonry	300
Granites, according to test	1,000 to 2,400
Gneiss	1,000
Limestones, according to test	700 to 2,300
Marbles, according to test	600 to 1,200
Sandstone, according to test	400 to 1,600
Slate	1,000

SHEAR.

Shearing stress involving diagonal tension in Portland cement concrete, in the proportions of 1-2-4	40
Direct shear (punching shear), in Portland cement concrete, in proportions of 1-2-4	120

4. *Structural Timber.*

The following stresses apply to seasoned timber to be kept under shelter in a dry location, and deflection not to increase with time. If the timber is to be used under other conditions, these stresses should be modified.

	BENDING		COMPRESSION.	
	Extreme Fibre Stress.	Maximum Longitudinal Shear.	Perpendicular to the Grain.	Parallel to the Grain. Column with l-d less than 10.
Oak	1,400	120	400	1,000
Yellow Pine Grade I	1,600	120	350	1,200
Yellow Pine, Grade II	1,200	85	300	900
Douglas Fir	1,500	100	325	1,100
Eastern Spruce	1,000	75	200	900
Western Hemlock	1,300	75	250	1,000
Norway Pine	1,000	75	250	800

l equals unsupported length in inches.

d equals diameter or least side in inches.

Where a moderate increase in deflection after first placement of the load is not objectionable, the compression and extreme fibre stresses here given may be increased 10 per cent. Stresses for timbers subject to vibration and impact, should not be thus increased.

Idem.

328. *Working Stresses for Columns.*

1. The working stresses per square inch for all steel, cast iron, or wooden columns having flat ends shall not exceed the values given by the following formulas:

2. *Steel Columns.*

Working stress, S equals 16,000-70 1/r

Where S equals allowable compression in lbs. per square inch.

1 equals allowable length in inches.

r equals least radius of gyration in inches.

The allowable compression (S) shall not exceed 14,000 lbs. per square inch, and the ratio of slenderness 1/r shall not exceed 120, except that for bracing and for compression members resisting wind stress only 1/r shall not exceed 150.

3 *Cast Iron Columns.*

Working stress, S equals 9000-40 1

Maximum 1/r shall not exceed 60.

4. *Wooden Columns.*

	For columns with l-d greater than 10, but not exceeding 30.
Oak	1,200-20 1/d
Yellow Pine, Grade I	1,400-20 1/d
Yellow Pine, Grade II	1,100-20 1/d
Douglas Fir	1,100-20 1/d
Spruce	1,100-20 1/d
Western Hemlock	1,200-20 1/d
Norway Pine	1,000-20 1/d

1 equals unsupported length in inches.

d equals diameter or least side in inches.

The unsupported length of wooden columns and compression members shall not exceed 30 times the diameter or least side, nor shall the unit stresses exceed those given in the table in Section 305 for 1/d less than 10.

5. *Columns Eccentrically Loaded.*

The stresses of every column which is eccentrically loaded shall be computed. The sum of the stresses due to the eccentricity added to all other stresses shall in no case exceed the working stresses stated in this Code.

The eccentric load of a column shall be considered to be distributed equally over the entire area of the column at the next point below that at which the column is securely braced laterally in the direction of the eccentricity.

Idem.

329. *Wind Pressure.*

1. All buildings or parts of buildings in which the height is more than three times the minimum horizontal dimension shall be designed to resist a horizontal wind pressure in any direction of 20 lbs. for every square foot of exposed surface. Wind bracing shall be provided by making the connection joint between girders and columns sufficient for the vertical load as well as the bending due to side pressure; or diagonal bracing shall be placed between columns, proportioned to transfer the shear of the side pressure to the footings. All details shall be designed to carry the stress in the main members.

2. The overturning moment due to wind pressure shall not exceed 50 per cent. of the amount of stability of the structure, unless the structure is securely anchored to the foundation. The anchors shall be of sufficient strength to safely carry the excess overturning moment, without exceeding the allowable unit stresses given in this Code.

3. When the stress due to the wind in any member or connection amounts to less than 50 per cent. of the total live and dead loads, it may be neglected. When the stress due to the wind exceeds 50 per cent. of the stress due to the combined live and dead loads, all these stresses shall be added together and the allowable unit stress for the total may be taken at 50 per cent. in excess of the values stated in Sections 327 and 328. In no case shall the section be less than required if wind forces be neglected.

4. In the design of circular chimneys, the area subject to wind pressure may be assumed as 60 per cent. of the diametral area.

Idem.

PART XV.

Cast Iron Construction.

330. *Cast Iron Columns.*

1. The outside diameter of least side of cast iron columns shall be not less than 5 inches, nor shall their unsupported length exceed sixty times their least radius of gyration.

2. The finished thickness of metal in the shaft shall not be less than one-twelfth the outside diameter or the greatest lateral dimension of cross section, nor less than ¾ inch. The thickness of metal in flanges, lugs, seats, and brackets shall be not less than 1 inch.

3. In all cast iron columns not cast with one open side, at least three holes 3/8-inch diameter shall be drilled 90 degrees apart near the middle of the shaft for the purpose of measuring the thickness of metal.

4. Whenever the core of a cast iron column has shifted more than one-fourth the thickness of the shell the strength shall be computed assuming the thickness of metal all around equal to the thinnest part, and the column shall be rejected if this computation shows the strength to be less than required by Section 324, paragraph 6.

5. A cast iron column shall be rejected whenever blow-holes or other imperfections reduce the effective area of the cross-section more than 10 per cent.

6. The ends of all cast iron columns shall be planed to a true surface perpendicular to the axis of the column. Successive column lengths shall be bolted together through end flanges with at least four bolts not less than 3/4 inch in diameter. No shims shall be used between the flanges.

7. If the core of a cast iron column below a joint is larger than the core of the column above, the core of the lower column shall be tapered up for a distance of not less than 6 inches, to the size of the core of the column above. In lieu of tapering the core, a steel or cast iron plate of sufficient thickness may be used between the flanges. The difference between the diameter or sides of any two successive column lengths shall not be greater than 2 inches.

8. The connection of beams and girders to cast iron columns shall be effected by means of seats reinforced by brackets of sufficient depth and thickness to support the entire load, and by lugs to which the webs of the beams and girders shall be bolted. The projection of the seat beyond the face of the column shall in general be not greater than 4 inches.

9. All holes in cast iron columns shall be drilled. Cored, or cored and reamed holes shall not be permitted. The diameter of holes shall not exceed that of the bolts by more than 1/16 inch. The distance from the center of a hole to the edge of a flange or lug shall be not less than 1/12 inches.

10. Cast iron columns shall not be used in any case where the load is sufficiently eccentric to reduce the unit compression to zero in the extreme fibre on one side of the axis of the column.

11. Cast iron columns shall not be used in the structural frame of buildings, the height of which is greater than three times their width.

12. Cast iron columns shall not be painted or covered until after inspection by the Supervisor of Buildings.

Idem.

331. *Cast Iron Bases and Lintels.*

1. Cast iron bases or shoes shall be planed on top. Bases which rest on steel girders shall be planed top and bottom. The thickness of metal shall be not less than 1 inch. The inclination of the outer edge of the ribs with the horizontal shall be not less than 45 degrees. Whenever one side of the bed plate exceeds 3 feet in length a reinforcing flange at least 3 inches high shall be provided.

2. Cast iron lintels shall be not less than ¾ inch in thickness, and shall not be used for spans exceeding 6 feet.

Idem.

PART XVI.

Steel Construction.

332. *Rolled Steel Columns.*

1. No rolled steel column shall contain material whether in the body of the column or used as lattice-bar or stay-plate of less thickness than ¾ inch.

2. In steel columns built up of a web plate and angles, and having an unsupported length greater than sixty times the least radius of gyration, the thickness of metal in the angles shall be not less than one-twelfth the width of the outstanding legs of the angles.

3. The unsupported length of a rolled steel column shall not exceed one hundred and twenty times its least radius of gyration, nor forty times its least lateral dimension or diameter.

4. The ends of all columns shall be faced to a plane surface at right angles to the axis of the columns. Wherever practicable, the connections between them shall be made with splice plates. When the sections of the columns to be spliced are such that splice plates cannot be used, a connection formed of plates and angles designed to properly distribute the stress may be used.

5. Where any part of the section of a column projects beyond that of the column above, the difference shall be made up by filling plates secured to the column by the proper number of rivets.

6. The pitch of rivets at the ends of built up columns shall not exceed four diameters of the rivets for a length equal to twice the greatest lateral dimension of the column.

Idem.

333. *Steel Girders and Beams.*

1 The thickness of the web in built up girders shall be not less than one-one hundred and twentieth of the distance between the flange angles of stiffeners, nor less than ¼ inch.

2. When the unsupported length (1) of the compression flange of a girder exceeds ten times its width (b) the unit stress in such flange shall not exceed 19,000-300 1/b, but in no case shall the unsupported length of the compression flange exceed forty times its width.

3. Stiffeners shall be provided over supports and under concentrated loads; they shall be of sufficient strength as a column to carry the loads and shall be connected with a sufficient number of rivets to transmit the stress to the web plate.

If the unsupported depth of the web plate exceeds sixty times its thickness, intermediate stiffeners shall be provided. All stiffeners shall be in pairs with close bearing against the flange angles.

4. When rolled steel beams are used in pairs to form girders they shall be connected together by bolts and iron or steel separators at intervals of not more than 5 feet.

All beams 12 inches and over in depth shall have at least two bolts to each separator.

5. Beams supported by girders shall be riveted or securely bolted to the same.

6. Every beam, lintel, or girder supported by a wall, shall be properly anchored thereto and shall rest upon a steel or iron plate so designed as to properly distribute the load over the masonry.

Idem.

334. *Framing and Connecting Structural Steel Work.*

1. Steel girders, columns, beams, trusses, and other steel work of floors and roofs shall be well and firmly connected together, and to the walls.

2. All connections shall be of sufficient strength to develop the full strength of the member. No connections except for lacing bars shall have less than two rivets.

Idem.

335. *Steel Trusses.*

1. Trusses shall be so designed that the stresses in each member can be calculated.

2. All trusses shall be held rigidly in position by efficient systems of lateral and sway bracing, struts being spaced so that the maximum limit of length to least radius of gyration, established in this Code, is not exceeded.

3. For tension members the actual net area only, after deducting rivet holes 1/8 inch larger than the rivets, shall be considered as resisting the stress.

4. Compression members in pin-connected trusses shall be so designed that the stresses shall not exceed 75 per cent. of the permissible working stress for columns. The heads of all eye-bars shall be made by upsetting or forging. No weld shall be allowed in the body of the bar. Steel eye-bars shall be annealed. Bars shall be straight before boring.

5. All pin-holes shall be bored true and at right angles to the axis of the members, and must fit the pin within 1/32 inch. Eye and screw ends shall be so proportioned that upon test to destruction fracture will take place in the body of the member. All pins shall be accurately turned.

Idem.

336. *Riveting and Bolting.*

1. All component parts of built up columns, girders, and trusses shall be riveted. All column connections in buildings over four stories in height shall be riveted. Riveting shall also be used in column splices, in web and flange splices of girders and trusses, and in all connections of beams and girders to columns.

2. Where riveting is impracticable, turned bolts may be used *provided* the holes for same are punched and reamed to a template and the bolts are accurately fitted.

3. All shop rivets, wherever practicable, shall be machine driven. The pitch of rivets shall never be less than three diameters of the rivet, nor more than 6 inches. In the direction of the stress it shall not exceed sixteen times the least thickness of the outside member. At right angles to the stress it shall not exceed thirty-two times the least thickness of the outside member.

4. Rivets shall fill the holes completely; the heads shall be hemispherical and concentric with the axis of the rivet; the length between heads, shall not exceed five times the diameter.

5. Where riveting is not required, connections may be made by bolts which shall be of wrought iron or mild steel with United States standard threads. The threads shall be full and clean; the nut shall be truly concentric with the bolt; and the thread shall be of sufficient length to allow the nut to be screwed up tightly.

6. When bolts are used in tension, the working stresses shall be reduced to 8,000 pounds per square inch of net area for steel, and to 6,000 pounds per square inch for wrought iron, and the load shall be transmitted into the head or nut by washers distributing the pressure evenly over the entire surface of the same.

7. In the construction of exterior stairs, landings, platforms and balconies, no rivet shall be less than 3/8-inch diameter and no bolt less than ½-inch diameter.

Idem.

337. *Protection of Structural Metal Against Corrosion.*

1. All structural metal work shall be cleaned of all scale, dirt, and rust, and be given one coat of paint at the shop completely covering all exposed surfaces. After erection all such work shall be painted at least one additional coat of a shade different from the first coat. The first coat of paint shall be made of pigments which shall be chemically inert after application, and shall be mixed with linseed or other drying oil. The amount of volatile matter shall be sufficient for easy spreading, and shall not injure the film of the paint. The paint must dry sufficiently hard within 24 hours so that it will not rub off or abrade easily. When the steel reaches the job, all abraded or injured portions must be thoroughly recoated with the same material as the shop coat before the second coat is applied. The second coat of paint shall be such as will not act as a solvent of the first coat, and shall be mixed with a pigment which shall be inert after application, and the vehicle shall be one that will not saponify under the action of cement mortar.

2. Surfaces of riveted work which come in contact with each other, shall be painted with two coats of paint before assembling.

3. All iron or steel used in damp locations or under water shall be embedded in Portland cement concrete. No paint shall be applied to the steel surfaces which are to be encased in concrete.

4. Any structural steel work which may be so placed as to be inaccessible for inspection after erection shall preferably be thoroughly cleaned of all rust and encased in Portland cement concrete before it is rendered inaccessible.

Idem.

PART XVII.

Ordinary Timber Construction.

338. *Wooden Beams or Joists.*

1. Every wooden beam in any party or fire wall shall be separated from any other beam in the wall by at least 6 inches of solid masonry. Such separation may be obtained by staggering the beams, corbeling, or by use of approved steel hangers properly anchored in the wall, and arranged to make the beams self-releasing. No wall shall be corbeled more than 2 inches for this purpose. If the beam ends are opposite each other in the wall the separation shall be not less than 8 inches.

2. No wooden floor or roof beam used in any building within the fire limits shall be less than 2 inches thick.

3. The thickness of wooden beams shall be not less than 2 inches in any building where the floor load is greater than 60 pounds per square foot.

4. Trimmer and header beams over 4 feet in length shall be hung in approved metal stirrups or hangers.

5. Every wooden beam, except header and tail beams, shall have bearings of at least 4 inches.

6. The ends of all wooden floor and roof beams, which rest on walls, shall be cut to a bevel of 3 inches in their depth.

7. Neither end of a floor or roof beam shall be supported on stud partitions, except in frame buildings, and residences not over two stories high.

8. All wooden floor and roof beams shall be properly braced with lattice bridging. The distance between bridging or between bridging and bearing shall not exceed 6 feet. So far as possible knots or other imperfections shall be excluded from the bottom and top quarters of timber beams, and in all sizes of timbers herein stated the actual standard sizes of the Southern Yellow Pine Association are acceptable as filling the requirements of this Code.

Idem.

339. No floor joist in a residence or other building shall be less than 2x8 under 14 feet in length, and 2x10 inches from 14 feet to 20 feet in length, over 20 feet not less than 2x12; ceiling joist not less than 2x6 up to 14 feet in length and 2x8 from 14 feet to 20 feet in

length, over 20 feet not less than 2x10. For joist of a flat roof the same dimensions as used for the floor joists, for a roof ¼ pitch and over the rafters shall not be less than 2x4 up to 14 feet long, over 14 feet and up to 20 feet not less than 2x6, over 20 feet long to be not less than 2x8, and for all spans of rafters of the longer limits as stated above there shall be a collar beam of at least 1x6 to each pair of rafters, or that the stresses provided herein may be used if desired.

No rafters shall be spaced more than 20 inches on center and no floor joists shall be spaced more than 16 inches on center. *Provided,* that the lengths of timbers stated above may be construed to mean between nearest supports.

Idem.

340. *Wooden Beams Separated from Masonry Chimneys.*

1. No wooden beams or joists shall be placed nearer than 1 inch of the outside face of a chimney or flue, whether the same be for smoke, air or any other purpose.

2. No woodwork shall be within less than 4 inches of the back face of the wall of any fireplace.

3. For smoke flues of boilers and furnaces where the brickwork is required to be more than 8 inches in thickness, the header beams shall be not less than 4 inches from the outside of the brickwork.

4. All spaces between a fire place and the wooden beams shall be filled with mineral wool, loose cinders, gypsum block, or other porous incombustible material.

5. The header beam, carrying the tail beams of a floor, and supporting the trimmer arch in front of a fireplace, shall be not less than 24 inches from the chimney breast.

6. No wooden furring or studding shall be placed against any chimney; the plastering shall be directly on the masonry, or on metal lathing.

Idem.

341. *Anchors for Wooden Beams and Girders.*

1. Each tier of beams shall be anchored to the walls with steel anchors at intervals of not more than 6 feet.

2. Where the beams are supported by girders, the girders shall be anchored to the walls and fastened to each other by steel straps.

3. The ends of wood beams resting upon girders shall be abutted together, end to end, or lapped, spiked, and strapped by steel straps of the same size and distance apart, and in the same manner as the wall anchors.

4. Each tier of beams running parallel to enclosing walls shall have approved 4-inch anchor strips let into the beams diagonally, crossing at least four beams.

5. Every pier shall be well anchored to at least three beams of each story, with steel anchors.

Idem.

342. *Timber Columns, Posts, and Trusses.*

1. All timber columns and posts shall be squared at the ends perpendicular to their axis, and iron or steel cap plates and base plates shall be provided.

2. Where the cap plate of a timber column or post supports a wooden girder any column above shall bear directly on the metal cap and shall not rest on the girder. Steel or wood cheek plates shall be bolted to the girders and post, when required for safety.

3. All bolts used in connection with timber work shall be provided with washers of such proportions as will reduce the compression on the wood at the face of the washer to that allowed in Section 327, paragraph 4, supposing the bolt to be stressed to its limit.

Idem.

PART XVIII.

Roofs and Roof Structures.

343. *Roof Coverings.*

1. All buildings except as given below shall have roof coverings of approved standard quality, such as brick, concrete, tile, or slate; or highest grade of tin roofing, or of asbestos shingles or of built-up roofing felt with gravel or slag surface, or of built-up asbestos roofing; or other roofings of like grade.

Exceptions:

(a) Dwellings

(b) Frame buildings

(c) Buildings not exceeding two stories or 30 feet in height and 2,500 square feet in area, and not used for factories, warehouses, or mercantile purposes.

2. The quality of roofing for all dwellings and other buildings exempted in paragraph 1, shall be as therein specified; or may be of

grade not lower than that indicated in the definition of approved fire-resisting roofing, Section 265, paragraph 3.

4. The wooden planking and sheathing of roofs shall not in any case be extended across side or party walls.

5. All flashings shall be of metal or approved composition properly incorporated with the roofing material. Copper flashings are recommended.

6. The top and sides of dormer windows shall be protected the same as the roof.

7. This section shall not be construed to prohibit the repairing of a wooden shingle roof, *provided* the building is not increased in height, but the renewal of such a roof is forbidden. No existing wooden shingle roof, if damaged more than 30 per cent. shall be repaired with other than approved roofing, *provided* that new shingle roofing may be put in residences and outhouses in the Third Zone only.

Idem.

344. *Roof Leaders.*—All buildings shall be provided with proper metal leaders, which shall be connected to the sewer. Where there are no sewers such leaders shall be connected by pipes below the surface to the street gutter. Detached dwellings, or other one-story buildings, may be exempt from the requirements of this section at the discretion of the Supervisor.

Idem.

345. *Scuttles on Roofs.*—Upon the roof of every building more than 15 feet high, which is not required to have stairs and bulkhead leading thereto, there shall be a scuttle with stairs or substantial stationary step ladder leading to same, which shall be easily accessible at all times to all occupants without the use of keys. All non-fireproof scuttles shall be covered on the top and edges with sheet metal or other approved fireproof material. The roof opening shall be at least 2 feet by 3 feet in size or a dormer window may supply the needed exit for a dwelling house.

Idem.

346. *Pent Houses and Bulkheads.*

1. All inclosures upon roofs for tanks, elevators or elevator machinery, and all pent houses and bulkheads upon non-fireproof buildings shall be of fireproof construction, or may be built of wooden studs filled with brick or other incombustible material and completely covered with metal or other approved incombustible material on all

sides, and all windows, doors, and trim shall be of metal, or metal covered, and be glazed with wired glass where glass is used.

2. All such structures upon fireproof buildings shall be of fireproof construction, including floors, and in all cases the outside surface shall be covered with approved incombustible weatherproof material, including all surfaces and the edges of doors and jambs.

3. Bulkheads or pent houses when used only for the purpose of enclosing staircases to roofs, elevator machinery, water tanks, ventilating apparatus, exhaust chambers or other machinery, need not be considered in determining the height of the building.

Pent houses when occupied for purposes other than hereinbefore described, shall not exceed 12 feet in height, and shall not ocupy more than 75 per cent, of the area of the roof, including all other bulkheads or pent houses; excepting that in tenement houses the requirements of Section 592, paragraphs 2 and 3, shall apply, and excepting, that no pent house shall be occupied or used for purposes than for the exclusive use of the janitor.

4. No staging, stand, sign, or other structure shall be constructed upon the roof of any building without first obtaining the written approval of the owner of such building.

Idem.

347. *Tanks.*

1. Tanks of more than 500 gallons capacity placed within any building or on or above the roof of any building, shall be supported by steel or masonry of sufficient strength to carry the same safely. Beams shall rest at both ends on steel girders, iron or steel columns, or walls or piers of masonry.

The supporting I beams shall either have the ends built into masonry work, or shall be securely framed together in a manner to prevent possibility of overturning or buckling due to oscillation of the tank in a wind storm.

2. In or near the bottom of each tank there shall be a pipe or outlet not less than 4 inches in diameter, fitted with a suitable gate valve, to permit ready drainage of the tank in case of necessity.

3. Wooden covers of tanks on roofs shall be covered with metal. Hoops of wooden tanks shall be of metal, round in section.

Idem.

348. *Cornices and Gutters.*

1. On all buildings or structures in the fire limits the exterior cornices and roof projections including those on show windows, and

all gutters shall be of incombustible material. All cornices not built as a part of the wall shall be secured with metal framing, look-outs, or anchors, *provided* that the cornices on all apartment houses and other buildings three stories or more in height, within the second and third zones, may have a wooden cornice made of wooden rafter ends sheathed on top, or a similar design and having all exposed surfaces covered with galvanized metal or other incombustible material fitting closely to the structural parts, and further *provided* that such buildings as above stated may have wooden cornices if located 10 feet or more from the property line, and further *provided* that residence buildings and structures two stories or less in height may use a substantial wooden cornice with incombustible gutters, within the second and third zones, and further *provided* that all overhanging roofing and similar works projecting the face line of walls shall be construed and termed as cornices.

2. Exterior wooden cornices or gutters on buildings or structures within the fire limits, which are unsafe or are damaged to the extent of one-half, shall be taken down; any replacement of same shall be made with incombustible materials.

3. Outside of fire limits where single residence buildings having masonry walls are placed nearer than 3 feet to a side or rear lot line, or 5 feet to aother building, the cornice or overhanging eaves on the front, sides and rear walls shall be of, or covered with, incombustible material. When such buildings are erected in rows, combustible cornices shall be fire-stopped with incombustible material between each building.

Board of Commissioners Ord. 788. Approved July 13, 1916.

349. *Skylights.*

1. All skylights shall have metal frames and sash, and the frames and parts thereof shall be riveted or otherwise securely fastened in addition to soldering.

3. Except as herein provided, all sky-lights shall be glazed with galvanized wire screens. If plain glass is used in sky-lights on buildings of a public character over any passageway or room of public resort, wire screens shall be placed beneath the skylights as well as above.

3. No wired glass shall be placed in a skylight at the top of enclosures for elevators, stairways, dumbwaiters, or vent and light shafts; all such skylights shall be glazed with thin glass and shall be protected by galvanized wire screens. The mesh of such screens shall

not exceed 1 inch, and the wire shall be of a size not less thtan 12 gauge. All screens shall have substantial metal supports and shall be placed at least 6 inches above skylights and project 6 inches beyond edges of skylights.

4. When metal louvres are used for ventilating purposes, over shafts or in connection with skylights, the louvres or slats shall be riveted to the metal frame.

5. Instead of a skylight over a shaft, a window of equivalent area may be placed in the side of the shaft above the roof, which is furthest removed from a property line. The window shall have incombustible frame and sash, and be glazed with thin glass.

6. Except windows in the side of shafts above the roof, wired glass only shall be used in skylights which are vertical or inclined at an angle of over 45 degrees, when subject to an exposure which would require wall epenings to be protected by fire windows or fire doors.

Board of Commissioners Ord. 759. Approved June 7, 1916.

350. *Protection of Skylights and Roof.*

1. Where walls are carried up above the roofs of adjoining buildings, proper means shall be provided and used by the person erecting the walls for the protection of the skylight and roofs of such adjoining buildings.

2. Should the owner of such adjoining building refuse permission to have his roofs and skylights protected, such refusal shall be reported in writing to the Supervisor and it shall then be the duty of the owner refusing such permission to make his skylights and roofs safe at his own expense. Such refusal by said owner shall relieve the owner or person erecting the building from any responsibility for damage done to persons or property on or within the premises affected.

Idem.

PART XIX.

Fire Doors, Fire Windows and Fire Shutters.

351. *Protection of Exterior Wall Openings.*

1. All windows, doors, and openings in business houses, and openings on opposite sides of alleys, courts, or open spaces within the Fire District, when the walls containing same are less than 30 feet apart.

All such windows, doors, and openings with their sash and frames, shall be of incombustible material or covered entirely with metal, and all glass used therein shall be of wired glass.

Board of Commissioners Ord. 875. Approved Dec. 5th, 1916.

2. All openings in a side wall above and facing on the roof of an adjoining building of other than fireproof construction shall be protected by fire doors or fire windows to a height of 50 feet above the roof measured in a vertical line. If the adjoining building has a fireproof roof, all openings in the said side wall shall be protected from the level of the adjoining roof to a height of 50 feet measured in a straight line from the adjacent edge of the nearest skylight or other opening in the adjoining roof, to the top of the opening in the wall.

3. All openings in a side wall above and facing on the roof of a building of other than fireproof construction which is separated from the side wall by a horizontal distance less than 30 feet, shall be protected by fire doors or fire windows from the roof level of the exposing building to a height of 50 feet measured from the top of the adjacent parapet wall to the top of the opening in the side wall; or 50 feet from the adjacent edge of the nearest skylight or other opening in the roof of the exposing building, if the roof be of fireproof construction.

4. Approved fire shutters at the discretion of the Supervisor may be substituted in place of the fire windows required in paragraphs 1, 2, and 3. In such cases at least one row in every three vertical rows of shutters shall be arranged to be readily opened from the outside, and a distinguishing mark be provided on these shutters as a guide to the Fire Department.

5. Occupants of buildings shall use due diligence to close all fire doors, shutters, and windows at the close of business each day.

Board of Commissioners Ord. 759. Approved June 7, 1916.

Idem.

352. *Protection of Interior Wall Openings.*

1. All openings in interior walls shall be protected by fire doors and fire windows where required by this Code, and wherever considered necessary by the Supervisor.

2. In buildings of all classes, all openings into halls or adjoining rooms from rooms in which paints, oils, varnishes, spirituous liquors, or drugs or other highly inflammable liquids or materials are stored

for purpose of sale or otherwise; or in which manufacturing processes, or business operations are conducted which are generally recognized as hazardous as regards fire, shall be protected by self-closing fire doors, or fire windows.

This paragraph shall apply to existing as well as new buildings.

Idem.

PART XX.

Protection of Vertical Openings.

353. *Enclosures for Stairways, Elevators, Escalators and Other Shafts in Fireproof Buildings.*

1 All interior shafts containing stairways required to be enclosed by Section 301 and except in dwellings, all shafts exceeding 6 square feet in area containing elevators, escalators, hoistways, chutes, ventilating ducts, or used for any other purpose, shall be continuously enclosed with fireproof walls or partitions built as follows:

(a) Brick or plain solid concrete not less than 8 inches in thickness for the uppermost 30 feet, increasing 4 inches in thickness for each lower section of 30 feet or part thereof; or 8 inches in thickness for the entire height when wholly supported at vertical intervals not exceeding 30 feet.

(b) Reinforced stone or gravel concrete not less than 6 inches in thickness for the uppermost 30 feet, increasing 2 inches in thickness for each lower section of 30 feet or part thereof; or 5 inches in thickness for the entire height when supported at vertical intervals not exceeding 20 feet and braced where necessary with lateral supports or suitable steel uprights.

(c) Reinforced cinder concrete not less than 5 inches in thickness for the entire height when supported at vertical intervals not exceeding 15 feet, and braced where necessary with lateral supports or suitable steel uprights.

(d) Semi-porous or porous terra cotta tile, or solid gypsum blocks not less than 6 inches in thickness for the entire height when supported at vertical intervals not exceeding 20 feet, and securely anchored by steel reinforcement encased in the construction.

Terra cotta tile shall have not less than two cells in its thickness, with shells and webs not less than 5/8-inch thick.

All openings in such partitions shall have substantial steel framing, the vertical members of which shall be securely attached to the floor construction above and below.

(e) Any material or form of construction which may be approved by the Supervisor after a fire and water test as required in Section 439, paragraph 5, but no such partition shall be less than 5 inches thick.

2. Enclosure partitions supporting floor loads shall be of materials and thickness required for bearing walls.

3. Portland cement mortar shall be used for all masonry work in shaft construction, except that gypsum mortar may be used to set gypsum blocks.

4. Concrete walls or partitions shall conform to the requirements of the sections on concrete construction.

5. The bottom of such enclosure, and the top when not extended through the roof, shall be of fireproof material not less than 4 inches in thickness.

6. When such shafts extend to the top story, they shall continue through the roof, and shall project not less than 5 inches above the roof surface. All such shafts shall be enclosed above the roof by at least 5 inches of brick, or stone concrete.

7. Every shaft which extends above the roof shall have a skylight, covering at least three- fourths of the area of the shaft.

8. All steel used to support shaft enclosures, as required in this section, shall so far as possible, be embedded in a fireproofing material, and shall be protected on all sides, in the manner required for steel in fireproof buildings. See Section 376.

9. When the compartment that contains the machinery for operating an elevator communicates with an elevator shaft, it shall be enclosed with fireproof partitions as required for the shaft.

10. A shaft shall not contain more than two elevators. The separating partitions shall be not less than 2 inches thick.

11. A stairway and elevator shall not be permitted within the same shaft enclosure.

12. All door openings into such shafts shall be protected by fire doors and shall be self-closing except for elevator doors. No glass shall be permitted in such doors except when doors in elevator shafts open upon an enclosed hallway a wired glass panel not exceeding 2 square feet without metal separators may be provided in each door. Care shall be exercised to insure that all such doors shall fit the opening as closely as practicable.

In factories and warehouses where elevator shafts open directly into a work or storage room, no wired glass shall be permitted in the doors. The size of such door openings shall not exceed 80 square feet.

13. Windows shall not be permitted in shaft enclosures, except those opening to the outside air, and which are at least 3 feet distant from any other opening; all such windows shall be stationary or automatic closing fire windows.

14. Where an elevator, escalator, or stairway as required in paragraph (1), connects two floors only in a building, it shall be enclosed in the same manner as for a continuous shaft, except that it may be left open in one story if enclosed in the other. Such elevator or escalator shall not be included in calculations for required means of exit, and no such stairway shall be considered as an exit from more than one floor.

Idem.

354. *Enclosures for Dumbwaiters and Other Shafts not Exceeding Six Square Feet in Area in Fireproof Buildings.*

1. All dumbwaiter and other shafts or chutes not exceeding 6 square feet in area, excepting dumbwaiter shafts which do not extend more than one story above the cellar or basement floor in dwellings, shall be continuously enclosed by partitions of brick, terra cotta, concrete, metal lath and cement plaster, gypsum blocks, or other approved fireproof material not less than 2 inches thick or of sheet metal not less than ⅛-inch thick and properly stayed with ribs and braces, which may meet the test specified in Section 439, paragraph 4. Such walls or partitions shall rest upon incombustible foundations, and shall be braced between floors with approved incombustible framing. Gypsum blocks may be set in gypsum mortar; all other blocks shall be set in Portland cement mortar.

2. When dumbwaiter or other small shafts are constructed of blocks or tile, all corner blocks or tile shall be held by metal angle clips or anchors, or be secured by other approved means.

3. Where a dumbwaiter shaft extends into the cellar or basement of a building, it shall be enclosed in that story with walls of masonry not less than 5 inches thick.

4. The bottom of such shaft shall be of fireproof material, and where such shaft does not extend through the roof, the top of the shaft shall be of fireproof material of at least the thickness of the enclosing partitions.

5. When such a shaft penetrates the roof it shall project at least 6 inches above the roof, and shall be covered with fireproof material and have a skylight covering at least three-fourths the area of the shaft.

6. All openings in dumbwaiter shafts shall be provided with approved self-closing fire doors.

7. No woodwork other than the guides and car shall be permitted in the construction of any such shaft.

Idem.

355. *Light and Vent Shafts.*

1. The walls of all light or vent shafts, whether exterior or interior, shall extend not less than 3 feet above the level of the roof and be coped.

2. In all buildings other than private dwellings and frame buildings, all windows opening into light and vent shafts shall be protected by fire windows.

Idem.

356. *Enclosures for Stairway, Elevator and Other Shafts in Non-fireproof Buildings.*

1. In every non-fireproof building of ordinary construction hereafter erected and every building altered or remodeled up to 50 per cent. of its value, all shafts as defined in Sections 557 to 560 shall be constructed as herein provided. The supporting beams or framework in the shaft shall be covered with metal lath or plaster board and plastered continuous with the wall.

2. Where desirable, elevator enclosures may be of metal frame with wire glass not less than ¼ inch thick.

3. Walls enclosing such shafts shall be made of solid gypsum or hollow terra cotta blocks not less than 4 inches thick, supported at vertical intervals not exceeding 14 feet, or a 2-inch solid metal lath, or plaster board, and cement plaster partitions, may be used when supported at vertical intervals as specified for blocks. Walls of shafts exceeding 14 feet in height between floors shall be made of blocks as herein specified not less than 6 inches thick or of solid plaster partitions not less than 3 inches thick, and the height of said walls shall not in any instance exceed 20 feet, and the supporting beams and frame work in the shaft shall be covered with metal lath or plaster board and plaster continuously with the walls.

4. When alterations of a minor character are made in connection with shafts in existing buildings and if in the judgment of the Supervisor the requirements to enclose as specified in paragraph 1 would be a substantial injustice and hardship then such enclosing wall may be constructed with not less than 2x4 wood studs spaced not over 2 feet apart and filled in between with solid gypsum blocks not less than 4 inches thick with metal lath or plaster board on both sides and covered with ¾-inch cement plaster.

5. In all cases where shafts do not extend through the roof the ceiling of said shaft shall be of incombustible material not less than 2 inches thick. Where shafts extend through the roof they shall be at least 3 feet above the same with walls of the same thickness as required in upper story of building, or of same construction as the shaft below and covered with metal or other weather-proof incombustible material on the exterior surface and shall have a skylight as specified in Section 353, paragraph No. 7.

6. Stairways in such buildings above first floor may be enclosed with the same construction as hereinabove noted.

Idem.

357. *Shafts and Hoistways in Existing Buildings.*

1. All existing buildings over two stories high, which are used above the first story for business purposes or for public assemblage, or for any purpose whatever, if over three stories high, except dwellings, the stairway, elevator and hoistway shafts being remodeled, rebuilt or installed, shall be separately and continuously enclosed by incombustible partitions. Such partitions or enclosing walls, shall be constructed as required in Sections 353 and 356 or in non-fireproof buildings, a 3-inch terra cotta, concrete, or gypsum block or tile; or a 2-inch solid metal lath and cement plaster partition; or a 2x4-inch wooden stud partition with 4-inch dimension at right angles to the wall and covered on each side with metal lath and not less than ¾-inch cement plaster, or by ½-inch fibre plaster board with filled joints and covered with sheet metal, may be substituted in buildings not exceeding 75 feet in height. Self-closing fire doors shall be used at all openings.

2. If it is necessary to preserve an open elevator or hoistway in an existing building; or the conditions are such that the requirement to enclose would be a substantial injustice to the owner or occupant, the above requirements may be waived; but the floor openings through which the elevator passes shall be equipped with automatically closing

trap doors not less than 1½ inches thick, made of two thicknesses of matched boards, covered on the under side with tin; the trap doors when closed shall extend beyond the openings on all sides. Such trap shall be protected by a substantial guard or gate, which shall be kept closed at all times except when in actual use.

Idem.

PART XXI.

Miscellaneous Construction Requirements.

358. *Light and Ventilation.*

1. In all buildings every sleeping room shall be provided with a window or windows opening directly upon a street, yard or court, except that in dwellings a window shall not be required in a sleeping room which is connected by an archway or opening containing not less than 50 square feet in the clear, with a room other than a sleeping room provided with at least two windows of not less than 15 square feet area each between stop beads, and opening directly on a street or yard.

The windows of every sleeping room shall have an area of not less than 12 square feet between stop beads, and the sash shall be arranged to open to the extent of one-half their area.

2. In every building, other than a detached dwelling and a dwelling occupied by not more than one family, every sleeping room shall be, for at least two-thirds of its area, not less than 8 feet 6 inches high from the finished floor to the finished ceiling, and shall be not less than 7 feet in width at its narrowest point, and have an area of not less than 70 square feet, except that in hotels, the area shall be not less than 80 square feet.

3. No sleeping room shall be placed in any story the ceiling of which is less than 4 feet 6 inches above the curb or adjacent ground level.

4. Lights and ventilation of sleeping rooms in tenement houses shall be as required in Sections 600-602.

Idem.

359. *Floor Lights.*—Floor lights shall have metal or reinforced concrete frames, and shall be of the same strength as the floors in which they are placed. The glass in floor lights shall be not less

than ¾-inch in thickness, and if any glass measures more than 16 square inches there shall be a wire mesh, either in the glass or under it.

Idem.

360. *Fire-stopping.*

1 Furred Walls. For all walls furred with wood the masonry between the ends of wooden beams shall project the thickness of the furring beyond the inner face of the wall for the full depth of the beams; or a course of masonry above and below the beams, shall project the full thickness of the furring beyond the face of the wall. In cases where floor beams are parallel to a wall furred with wood, there shall be a space of not less than 2½ inches between such wall and the nearest beam. This space shall be filled in solidly with brickwork, or concrete for the full depth of the floor beams.

2. Studded-off Spaces. Where walls are studded-off, the space between the inside face of the wall and the studding at the floor level shall be fire-stopped with 2-inch thick fire blocking of same width as the wall and placed at every 6 feet in the height thereof.

3. Partitions. Where stud partitions rest directly over each other, and cross the wooden floor beams at any angle, they shall run down between the floor beams and rest on the top plate of the partition below, and shall have the studding filled in with 2-inch fire blocking between the uprights at each floor level. Such stops shall be arranged to entirely separate the spaces between floor beams and those between partition studs in a manner to effectually cut off draft openings from story to story.

When sliding doors are pocketed in partitions, care shall be exercised to insure that such pockets be completely fire-stopped at top and bottom.

4. Wainscoting. The surface of the walls or partitions behind wainscoting shall be plastered flush with the grounds and down to the floor line.

5. Stairs. The space between stair carriages shall be fire-stopped at least once in the middle portion of each run.

6. Ducts and Chases. Ducts, Chases, or shafts, for pipes, wires, cables and for similar purposes, shall be constructed as required in Section 353-356 or shall be fire-stopped at each floor.

Idem.

361. *Requirements in Non-fireproof Buildings Used for Business and Residence.*

All ordinary construction in non-fireproof buildings of Classes C and D over two stories, or 35 feet high, where the lower stories or portions thereof are used for business, and the stories above for residence purposes, shall have all partitions and ceilings separating the business portions from the residence portions, covered with metal lath or ¼-inch fibre plaster board and plastered with cement or cement-tempered plaster to a total thickness of 5/8 inch; or plaster board may be covered with sheet metal. Or other equivalent fireproofing may be used. There shall be no windows in such partitions, and all other openings shall be protected by fire doors.

Stairway, elevator and other shafts in such buildings, shall be constructed in conformity with requirements of Section 356.

Fire-stops shall also be provided at the line of the ceilings to completely cut off all communication to floors above through hollow stud partitions or side walls, as required by Section 360, paragraphs 1, 2 and 3.

Idem.

PART XXII.

CELLARS, VAULTS, AREAWAYS AND PROJECTING STRUCTURES.

362. *Requirements for Cellars.*

1. Drainage. Before the walls of buildings are carried above the first tier of beams, the cellar shall be connected with the sewer and provided with a properly screened intake. Should there be no sewer in the street, or if the cellar is below water or sewer level, provision shall be made to prevent water accumulating in the cellar, to the injury of the foundation.

2. Floors. Any floor laid on the ground shall be made of concrete not less than 4 inches thick. Such floors and the exterior walls shall be waterproofed when required by the Supervisor.

3. Partitions. Except in dwellings, and in frame buildings outside the fire limits, all partitions in cellars, excepting partitions enclosing fuel bins, shall be of fireproof construction.

Idem.

363. *Ceilings.*—No wooden ceiling shall be placed on the overhead of any store if there be offices or sleeping rooms located above same, nor on the basement ceiling of any hotel, apartment, flat, or

rooming house, but all such ceilings shall be contructed of approved sheet metal or with metal lath, or ¼-inch plaster board and surfaced with two coats of cement plaster, *provided* that wooden panel ribs and mouldings may be placed flat on the completed face of such plastered ceilings in stores and auditoriums for the purpose of ornamentation, and further *provided* that other approved ceiling of fireproof materials may be used.

Idem.

364. *Vaults Under Sidewalks..*

1. Where a vault is built under the sidewalk a wall shall be constructed to retain the adjacent banks.

2. The roofs of all vaults shall be of approved incombustible material. Glass, when used in the roofs of the vaults, shall measure not more than 16 square inches in one light.

3. All vaults shall be thoroughly ventilated.

Idem.

365. *Areaways, and Projections Beyond the Building Line.*

1. No railings, steps, or any portion of a building or structure shall project beyond the building line at any point less than 9 feet above the curb level.

2. No bay, oriel or show window shall project beyond the building line at any point. When erected within the fire limits they shall be constructed of incombustible material, except that on a dwelling such window may be permitted of wooden framework covered with incombustible material, *provided* it does not extend more than 3 feet above the second-story floor. Cornices of, or over show windows, or show fronts more than 9 feet above curb level may project not more than 12 inches beyond building line.

3. Alterations or repairs to areaways, steps, store fronts, or projections, or show windows shall be subject to the requirements of this section.

Idem.

PART XXIII.

"Mill" Construction.

366. *Definition.*—"Mill" Construction (also called "Slow-burning Construction") is a term applied to buildings having masonry

walls and heavy timber interior construction with no concealed spaces. Such buildings are usually occupied for factory purposes, and should always be protected by a system of automatic sprinklers.

Idem.

367. *Foundations. and Walls.*

1. Foundations shall conform to the requirements of Sections 273 and 274.

2. Outside walls shall be of masonry and shall conform as to construction and thickness to the requirements of Section 282.

3. Fire and party walls shall be of masonry, and the thickness and construction shall conform to the requirements of Sections 282-284-285 and 286. Parapets shall project to cut-off overhang of roof if any, and special parapets shall be provided where monitors or roof lanterns are near fire walls.

Idem.

368. *Protection of Wall Openings.*

1. Openings in exterior walls shall be protected with approved fire doors or shutters, or if the exposure is not too great, approved wired glass windows may be used. The openings to be protected shall be as specified in this section and Section 351.

2. All openings such as shafts and belt holes, etc., shall be avoided where possible, but where they are necessary they shall be protected by approved fire shutters.

3. All windows and other openings in side walls of buildings for a distance of at least 10 feet each side of a fire wall, and shall be protected as called for in (1.)

4. Where main sections are separated by fire walls and adjoin so as to form an angle, all window or other openings in side walls for a distance of not less than 30 feet from the angle, shall be protected as called for in (1.) Where minor sections, such as boiler or engine houses, adjoin, the above rule need apply only to main sections of buildings. Where there are no openings in one section within 10 feet of the fire wall, the other section need not be protected.

5. When buildings of different heights adjoin, all windows of the higher section above the roof of the lower sections, as well as all windows within 10 feet of the fire wall on each section, shall be protected as called for in (1.)

6. Openings in fire walls shall be protected as required in Section 285.

Idem.

369. *Columns and Girders or Floor Timbers.*

1. Columns, if of timber, shall be not less than 8 inches in smallest cross sectional dimensions, preferably all corners should be rounded or chamfered.

2. Wooden columns shall be superimposed throughout all stories on iron or steel post caps with brackets.

3. Iron or steel columns or girders may be used if protected as required in Section 378.

4. Wooden girders or floor timbers shall be suitable for the load carried, but in no case less than 6 inches either dimension, and shall rest on iron plates on wall ledges and where entering walls shall be self-releasing. Walls may be corbeled out to support floor timbers where necessary. The corbeling shall not exceed 2 inches.

5. So far as possible, girders or floor timbers shall be single stick.

6. Where wooden beams enter walls on opposite sides, there shall be at least 12 inches of masonry between ends of beams, and in no case shall they enter more than one-quarter the thickness of the wall.

Idem.

370. *Floors.*

1. Floors shall be not less than =2⅝-inch dressed splined or tongued and grooved plank covered with ¾-inch dressed flooring laid crossways, or diagonally. Top flooring shall not extend closer than ½-inch to walls so as to allow for swelling in case floor becomes wet. This space shall be covered by a moulding so arranged that it will not obstruct movement of the flooring.

2. All exposed woodwork in interior construction shall be planed smooth.

3. Basement floor may be concrete or any other incombustible material.

4. Pipes or conduits extending through floors shall be fitted with metal thimbles and made watertight to a distance of 3 inches above floor.

Idem.

371. *Roofs, Skylights, and Cornices.*

1. Roofs shall be of plank and timber construction and flat, except for pitch necessary for proper drainage. Plank shall be not less than 2⅛ inches dressed splined, or tongued and grooved. Timbers shall be not less than 6 inches either dimension and shall be single stick.

Both roof timbers and planks shall be self-releasing as regards walls.

2. Roof coverings shall comply with requirements of Section 343 as specified for buildings within fire limits.

3. Skylights shall be built according to the requirements of Section 349.

4. Cornices shall comply with the requirements of Section 348.

Idem.

372. *Partitions.*—Partitions shall be constructed of incombustible material or of 2-inch matched plank or double matched boards with joints broken, preferably coated with fire-retarding paint.

Idem.

373. *Stairways and Elevators.*

1. Stairways and elevators shall preferably be enclosed by brick walls at least 12 inches thick, or reinforced concrete not less than 8 inches thick. Where one or more brick walls of stairway or elevator shafts are less than 8 feet on a side and contain no doorways, they may be 8 inches thick, but no wall of such thickness shall extend more than one story in height.

2. When such shafts are inside of a building the walls shall pierce all floors and extend at least 3 feet above roof.

3. Approved fire doors shall be installed at all openings into shafts. Those for stairway and power shafts shall be self-closing.

4. Interior windows in shaft are prohibited.

Idem.

PART XXIV.

Fireproof Construction, and Fire-proofing.

374. *General Requirements for Fireproof Buildings.*

1. The walls of every fireproof building shall be constructed as specified in Sections 277-286. The floor and roof construction shall conform to the construction and test requirements specified in Sections 375-377. Reinforced concrete buildings constructed as specified in Part XXII, shall be classed as fireproof construction.

2. The space between the floor arches or slabs and the floor finish shall be solidly filled with concrete as specified in Section 437. The

filling beneath wooden flooring shall be made flush with the under side of the floor boards.

3. In buildings of Class E, except stables, also in apartment houses, clubs and hotels, when of fireproof construction, the floors may preferably be made impervious to water; and arranged to drain to scuppers or interior drainage pipes, provision being made to discharge water at the rate of 300 gallons per minute per each 1000 square feet of floor area.

4. Except as permitted in Section 301, paragraph 1, all shafts and public hallways shall be enclosed and separated from the rest of the floor space by fire-resistive enclosures, as specified in Sections 353 and 379 and shall have floor surfaces and trim of approved incombustible material. The stairs and stairway landings shall be of approved incombustible material.

5. No woodwork or other combustible material shall be used in the construction of any fireproof building, except wooden floor sleepers, grounds, bucks, and nailing blocks when entirely embedded in incombustible material; also the finish flooring, and interior doors and windows, when not otherwise specified, with their frames, trim, and casings; also interior finish when backed solidly with fireproof material, may be of wood.

6. Exterior wall openings shall be protected as required in Section 351.

Idem.

375. *Fireproofing, Floor and Roof Construction.*

1. Fireproof construction between steel floor or roof beams, shall consist of segmental arches of brick or concrete, or of segmental or flat arches of hollow terra cotta, or reinforced cinder, stone, or gravel concrete; or of such other equally fire-resisting material or construction as may be approved by the Supervisor after fire, water, and strength tests.

2. All segmental arches shall have a rise of 1¼ inches to the foot of span. Steel tie-rods of proper size spacing, and location shall be used in all arches to properly resist the thrust. Such tie rods shall be completely encased to a depth of at least 2 inches in fireproofing material which shall extend into and be anchored to the arch.

3. The spacing of floor or roof beams in fireproof construction shall not exceed 8 feet on centers except when the slabs between them are composed of reinforced stone or gravel concrete, in which case they shall be limited by the design according to Section 398, etc.

4. Brick Arches. Segmental arches of brick shall have a thickness of not less than 4 inches for spans of 3 feet or less, and 8 inches for spans exceeding 3 feet and not exceeding 8 feet. Brick arches shall be composed of good, hard common or hollow brick. The brick shall be laid to a line on the centers and properly and solidly bonded; each longitudinal line of brick shall break joints with the adjoining lines. The arches shall spring from suitably designed solid skewbacks made of the same materials as the arches, and be properly keyed. The brick shall be well wet before laying, and the joints solidly filled with mortar.

5. Terra Cotta Arches. Hollow terra cotta tile used for floor or roof arches shall be hard burned or semi-porous and of uniform density and hardness. All terra cotta arches shall be properly keyed. The key blocks shall always be placed within the middle third of the span.

Segmental arches shall have sufficient depth between the top and bottom faces to carry the load to be imposed, but not less than 6 inches. The tile shall have at least two cellular spaces in the depth.

Flat arches shall have a depth of not less than 1¾ inches for each foot of span between the beams, this not to include any portion of the depth of tile that projects below the under side of the beams. The total depth shall in no case be less than 9 inches, and the tile shall have not less than three cellular spaces in the depth.

The shells of arch blocks shall be not less than ¾ inch in thickness, and the webs shall be not less than 5/8 inch in thickness. Every arch block shall have at least one continuous vertical internal web for each 4 inches in width. There shall be rounded fillets at all internal intersections. The skewbacks of all hollow tile arches shall be of such form and section as to accurately fit the beams and properly receive the thrust of the arches, and shall have shells at least 1 inch thick, and webs not less than ¾-inch thick, or tile of standard manufacture may be used *provided* working stresses specified herein are complied with.

The safe working load on terra cotta arches shall be determined by design or by test as specified in Section 440. The allowable extreme fibre stress in compression in terra cotta floor tile shall be taken as 500 pounds per square inch on net section.

6. Concrete Arches and Slabs. All segmental arches or flat slabs of reinforced concrete shall be designated and construced in accordance with the requirements of this section and of Parts XXVI or XXVII.

7. Roofs. Hollow terra cotta or concrete tile, or solid gypsum blocks, may be used for fireproofing between the steel framework of roof construction; but such tile or blocks shall be not less than 3 inches thick or tile less than 2 inches thick, and the supporting steel members shall be spaced not more than 25 inches on centers. When solid blocks or tile are properly reinforced to resist the bending stresses, the steel supporting members may be spaced not to exceed 30 inches apart. The bottom flanges of steel members shall be protected as elsewhere provided.

Idem.

376. *Fireproofing, Protection of Structural Members.*

1. Protection of Wall Columns. All columns which support steel girders carrying exterior walls, and all columns which are built into walls and support floors only, shall be protected against corrosion by a coating of Portland cement mortar at least ¼-inch thick, and against moisture and fire by a casing of masonry, which shall be not less than 4 inches of brick or 2 inches of concrete on all surfaces; all to be well bonded into the masonry of the enclosing walls.

2. Protection of Wall Girders. The wall girders shall have a casing of Portland cement mortar and the same masonry protection as required for wall columns, all to be securely tied and bonded; but the extreme outer edge of the flanges of beams, or plates or angles connected to the beams may project within 1½ inches of the outside surface of such casing. The inside surfaces of the girders shall be similarly protected by masonry, or if projecting inside the walls, they shall be protected by concrete, terra cotta, or other approved fireproof material not less than 1½ inches thick.

3. All metal structural members which support loads or resist stresses, other than those provided for by the two preceding paragraphs, shall have a protection of fireproofing as herein specified. The protection material shall be brick, concrete, terra cotta, or gypsum block. Concrete shall be of the quality prescribed in Sections 427-433; terra cotta may be solid or hollow, and shall be porous or semi-porous; neither shells nor webs shall be less than 5/8 inch thick; gypsum blocks shall be solid and of quality approved by the Supervisor. Plaster shall not be considered a part of any required fireproofing for metal structural members except where specifically mentioned as such. See paragraph 8, also Section 378.

4. All bricks or blocks used for fireproofing shall be set in Portland cement mortar, except that gypsum blocks may be set in gypsum mortar.

5. Interior Columns.

(a) The protection shall cover the columns at all points to a thickness of not less than 2 inches and be continuous from the base to the top of the column. The extreme outer edges of lugs, brackets, and similar supporting metal may project to within 1 inch of the outer surface of the protection.

(b) If brick or blocks are used for fireproofing columns, they shall be accurately fitted, laid with broken joints, and all spaces between the outside layer and the metal solidly filled with masonry; or a concrete filling may be used. No voids between the metal and the protecting casing shall be permitted.

(c) Galvanized steel wire not smaller than No. 12 gauge, shall be securely wrapped around block column coverings so that every block is crossed at least once by a wire. The wire shall not be wound spirally around the column, but each turn or band shall be a separate unit and shall be twisted tightly or otherwise securely bound. Other equivalent anchorage may be employed if approved by the Supervisor. No block used for this purpose shall exceed 12 inches in vertical dimension.

(d) Columns located in damp places shall receive a coat of at least ½-inch of Portland cement mortar before application of the fireproofing.

(e) Columns made of steel or wrought iron pipe filled with concrete, shall be protected by at least 1½ inches of fireproofing.

(f) Where the fireproofing of columns is exposed to damage from trucking or handling of merchandise, the fireproofing shall be jacketed on the outside for a height of not less than 3 feet from the floor with metal or other approved covering.

6. Protection of Steel Girders and Beams.

(a) The protection of the webs and bottom flanges of girders and all members of trusses shall have a thickness of not less than 1½ inches at all points. The protection of the webs and bottom flanges of beams, lintels, and all other structural members shall be not less than 1 inch at any point.

(b) If hollow terra cotta tile be used for protection, the lower flanges of beams and similar members shall be encased either by lugs which form part of the skewbacks and extend around the flanges meeting at the middle; or by tile slabs held in position by dove-tailed lugs projecting from the skewbacks. In either case care shall be taken to insure that all joints be solidly filled with mortar.

7. Concrete protection for all structural members shall be held in position by suitably designed interior steel anchors hooked securely around the flanges or angles of the members at intervals not exceeding 12 inches apart; these anchors shall be not less than ⅛ inch in thickness if flat or 1/10 inch in diameter if wire, and shall be located at a distance not less than ½ inch, nor more than ¾ inch from the outside surface. Provision shall be made to prevent displacement of anchors while concrete is being deposited. When the flange width of steel members exceed 6 inches, the wire used for anchoring the concrete protection shall be not less than ⅛ inch diameter.

8. Steel angle or channel struts, or other structural framing not elsewhere provided for, which are used for support in any wall, partition, or other construction, shall be fireproofed as required in this section or in Section 379, paragraph 4.

Idem.

377. *Miscellaneous Fireproofing Provisions.*

1. Defective or damaged fireproofing materials shall not be used. All fireproof construction injured or damaged after being erected shall be repaired to the satisfaction of the Supervisor before any filling or finish is placed over same.

2. No pipes, wires, cables or other material shall be embedded in the required fireproof protection of columns or other structural members.

3. All metal lath and plaster ceilings shall be supported by hangers of clamps attached to the floor or roof construction in an approved manner. Such supports shall be of such section and weight as will support the west plaster without deflecting more than 1/30 inch per foot of span.

4. All studding for metal lath partitions or wall furring shall be of sufficient size to carry the weight imposed and shall be spaced not more than 16 inches on center, *provided* that this clause shall not be interpreted to prohibit the use of approved 2-inch thick solid plaster board or plaster partitions with spacing of 24 inches or the use of approved 2-inch thick solid reinforced metal lath and plaster partitions with spacing up to 36 inches, or if the metal lath is sufficiently reinforced with integral stiffening members the metal studs may be eliminated.

5. Metal lath may be either of galvanized or painted steel or iron of standard weight per square yard for the gauge specified. Wire

lath shall not be less than 21 gauge and sheet metal lath not less than 26 gauge, *provided* that metal lath may be 28 gauge only when reinforced by approved integral stiffeners or when plastered with Portland cement mortar. Metal lath shall be laced to supporting metal furring or studs with galvanized wire at intervals not exceeding 6 inches, except that where metal clips are provided for this purpose on metal furring studs or joist the wire lacing need not be used.

6. After floors are constructed, no opening greater than 2 square feet shall be cut through them unless suitable metal framing or reinforcing is provided around the opening. After pipes or conduits are in place, all openings around them shall be filled in solidly with fireproofing material unless approved close fitting individual sleeves are provided as specified herein.

Idem.

378. *Protection of Metal Structural Members in Non-Fireproof Buildings.*—Steel girders and steel or iron columns which support masonry walls, other than those facing upon a street, shall be protected by at least 1½ inches of fireproofing of the same materials; or by 1½ inches of metal lath and cement plaster; the latter being applied in two layers with an air space between them. All other iron or steel columns shall be protected by at least 1 inch of metal lath and cement plaster or its equivalent. The lath shall be of quality specified in Section 377.

Idem.

379. *Partitions in Fireproof Buildings.*

1. In fireproof buildings, all partitions enclosing public halls or separating the spaces occupied by different tenants, and all other permanent partitions, shall be built not less than 4 inches thick if of solid or hollow brick, terra cotta, concrete, or gypsum blocks or tile; other partitions if of reinforced concrete shall be not less than 3 inches thick or 2 inches thick if of solid metal lath and cement plaster; or of such other incombustible materials and thickness as shall meet the requirements of the partition fire test as prescribed in Section 439, paragraph 4. The required thickness for block or tile partitions shall be exclusive of plaster. All such partitions shall be securely fastened to the fireproof construction of the floor and ceiling. All bricks, blocks or tile shall be laid with broken joints.

2. All partitions not enumerated above shall be of incombustible materials, except for woodwork permitted in Section 374.

3. All partitions in fireproof buildings shall be independently supported at each floor level, and which lateral support is not sufficient they shall be stiffened by steel reinforcement encased in the construction.

4. Structural steel members necessary for supporting a partition, shall be protected by at least 1 inch of fireproofing. Cement plaster, or cement-tempered plaster may be accepted for this purpose if properly keyed.

5. Reinforced concrete for partitions shall be as required in Sections 374-390 and 427-433. Terra cotta tile shall be porous or semiporous in quality, and if hollow, shall have two cells in the thickness, with the thickness of shells inclusive of plaster key, not less than ¾ inch, and the thickness of webs not less than 5/8 inch. The shells and webs of hollow gypsum or concrete blocks or tile shall be not less than ¾ inch. Gypsum shall be used only in dry locations. Metal lath and studding shall conform to the requirements of Section 377.

6. All openings in public hallway partitions shall preferably be protected by approved fire doors or fire windows. Approved fire doors may be permitted in a partition separating tenants in a building, but no glass shall be permitted in openings in such partitions.

7. If a stair hallway be considered as a part of the stairway, and the latter is not separately enclosed as required by Section 353, then the enclosing partitions for the hallway shall be considered as the stairway shaft, and shall be built acording to the requirements of Section 353.

8. If the partition surrounding a public hallway be erected in accordance with the requirements for a fire exit partition, it may be considered as a horizontal exit for an occupancy equal to area of the hallway in square feet divided by three.

Idem.

380. *Fire-Resistive Partitions in Non-Fireproof Buildings.*

1. In non-fireproof buildings of Classes B, C, D, and E, all partitions enclosing public hallways, or separating the spaces occupied by different tenants, shall either be built as required in Section 379, or they may be built of not less than 3-inch approved solid or hollow partition blocks or tile, or by 3-inch hollow or 2-inch solid metal studding and lath with cement plaster, or by 2x4-inch wooden studding with metal lath and ¾ inch of cement or cement-tempered plaster on each side; or of any other materials and thickness as shall meet

the requirements of the partition fire test as prescribed in Section 439, paragraph 4. Wooden studs shall be set with the 4-inch dimension at right angles to the plane of the wall, and fire blocked at least every 6 feet in the height.

2. All such partitions shall be fire-stopped the full depth of the floor beams at each floor level in the manner specified in Section 360.

3. Openings in such partitions shall preferably be protected by fire doors and windows as specified in Section 379.

4. The principles governing hallway partition construction as stated in Section 379, paragraphs 7 and 8, shall apply to the construction of like partitions in non-fireproof buildings, consistent with the requirements of Section 356 for such construction.

Idem.

PART XXV.

381. *Pressed Steel Construction.*

1. Pressed steel may be used in all buildings, or parts of buildings, where the allowable floor loads, as specified in Section 295 does not exceed 100 pounds per square foot.

2. Such construction shall be designed in accordance with the allowable working stresses provided in this Code for rolled steel, and other regulations, limiting the strength of columns (Section 297, paragraph 2,) unsupported length of the compression flange (Section 328) deduction of area cut out by rivet polls and prongs as effective net area, etc.

3. Fire proofing of pressed steel floor construction shall consist of not less than 2 inches of concrete on top of beams, and one inch of cement plaster on metal lath underneath. Pressed steel stud walls and partitions shall be fire proofed with not less than one inch metal lath and cement plaster and all structural steel supporting members shall be fire proofed as provided in this Code.

Idem.

PART XXVI.

Reinforced Concrete Construction.
General Requirements.

382. *Definition.*—The term "reinforced concrete" in this Code shall mean an approved concrete mixture in which steel is embedded in such a manner as to resist the tensile stresses and to add rigidity and strength to concrete in compression.

Idem.

383. Approved for all Types of Buildings. Reinforced concrete will be approved for all types of building construction, provided the design conforms with good engineering practice, and the working stresses do not exceed those herein specified. The construction shall meet the requirements of this Code in all respects.

Idem.

384. *Construction Plans and Specifications.*

1. The plans and specifications required to be filed with the Supervisor shall be accompanied by a written certificate of the architect or engineer certifying that the general arrangement of the entire construction in all important details, including the size, length, the qualities, proportions, and the dead and live loads each floor is designed to carry are in conformity with the provisions of this Code.

2. All such plans and specifications shall be signed by the architect, engineer, contractor or person applying for the permit. In no case shall the construction deviate from the approved plans and specifications except by written consent of the Supervisor. (*See Sec. 254.*)

Idem.

Specifications for Materials.

385. *Quality of Concrete.*

1. The concrete shall consist of a mixture of a plastic or viscous consistency of one part of cement to not more than six parts of aggregate, fine and coarse, either in the proportion of one part of cement, two parts of sand and four parts of stone or gravel, or in such proportion as to produce a maximum density. Such concrete shall develop a crushing strength of at least 2,000 lbs. per square inch at 28 days when made under laboratory conditions of manufacture; the

materials and consistency being practically the same as that used in the field. Test specimens shall be removed from moulds as soon as well set and stored in damp sand until tested.

2. Concrete in the proportion of one part of cement to four and one-half parts of aggregate, which may be desirable for special work such as columns, shall develop a crushing strength of not less than 2,400 pounds per square inch at 28 days, and the working stress of such concrete may be increased 20 per cent. over that permitted elsewhere in this Part.

3. Each test shall consist of a set of at least three duplicate specimens in the shape of cylinders with a height of double the diameter; or cubes having a least dimension of 6 inches. Cubes shall be tested standing on bed and 75 per cent. of the resulting test strength shall be assumed as the strength of the standard cylinder specimen 8 inches in diameter and 16 inches high. The average of the three tests shall be taken as the result for record. The smallest dimension of the test piece should be at least four times the size of the coarsest particle of stone.

4. In addition to these preliminary tests which are necessary for the purpose of design, the Supervisor may require additional tests to be made upon specimens cast during construction of the building. The test specimens shall be secured at such times and in such portions of the structure as the Supervisor may direct. This test concrete may be taken from the barrows as the concrete is being wheeled to place or from the forms after it is deposited. The results of such tests shall be considered in conjunction with the test of workmanship described in Section 442.

Idem.

386. *Quality of Cement.*—All cement used in reinforced concrete shall be Portland cement meeting the requirements of Section 317.

Idem.

387. *Quality of Fine Aggregate.*

1. The fine aggregate shall consist of sand, crushed stone or gravel screenings passing when dry a screen having four meshes to the lineal inch; *provided,* not more than 10 per cent. shall pass a screen having 100 meshes to the lineal inch. It shall be clean, coarse, or hard, durable material and shall contain not more than 5 per cent. of loam and other deleterious matter, and that not more than 50 per cent. shall pass a sieve having 50 meshes per lineal inch.

2. Fine aggregate shall always be tested. It shall be of such quality that mortar composed of one part Portland cement and three parts fine aggregate by weight, when made into briquettes shall show a tensile strength at least equal to the strength of 1 : 3 mortar of the same consistency made with the same cement and standard sand, and shall show a tensile strength of at least 180 pounds per square inch at the age of seven days. If the aggregate be of poorer quality, the proportion of cement should be increased to secure the desired strength.

Idem.

388. *Quality of Coarse Aggregate.*

1. Coarse aggregate shall consist of crushed stone or gravel which is retained on a screen having ¼-inch diameter holes, and shall be graded in size from small to large particles. The maximum size shall be such that all the agrgegate will pass through a 1¼-inch diameter ring. The particles shall be clean, hard, durable, and free from all deleterious material.

2. Gravel shall be free from clay or loam except such as naturally adheres to the particles. If clay or loam is in such quantities that it cannot be readily removed by dipping in water or brushing lightly with the hand, the gravel shall be washed. When bank-run gravel is used, it shall be screened from the sand and remixed in the proper proportion for fine and coarse aggregate.

Idem.

389. *Quality of Reinforcement.*—All steel used in reinforced concrete shall meet the requirements of the current Standard Specifications for Billet-Steel concrete Reinforcement Bars of the American Society for Testing Materials. No reinforcement produced from re-rolled rails or second-hand materials shall be used in any structure without the written permission of the Supervisor. If such reinforcement be permitted, it shall meet the requirements of the current Standard Specifications for Rail-Steel Concrete Reinforcement Bars of the American Society for Testing Materials. Cold drawn steel wire made from open hearth billets of the grade of rivet steel or from Bessemer billets, may be used in floor and roof slabs, column hooping, and reinforcement for temperature and shrinkage stresses. It shall have an ultimate strength of not less than 85,000 pounds per square inch and test specimens shall bend 180 degrees around their own diameter without fracture.

Idem.

Factors Controlling Design.

390. *Allowable Unit Working Stresses.*—In the design of reinforced concrete structures when the concrete is mixed in the proportions of 1:2:4, and satisfies the strength requirements of Section 385, the following working stresses for concrete and steel shall be used:

	Lbs. per Sq. Inch.
Extreme fibre stress on concrete in compression	650
Concrete in direct compression	500
Shearing stress in concrete when diagonal tension is not resisted by steel	40
Shearing stress in concrete when web reinforcement is proportioned to resist two-thirds of the external vertical shear	120
Bond stress between concrete and plain reinforcing bars	80
Bond stress between concrete and deformed bars	100
Tensile stress in steel reinforcement	16,000

Bearing of a concrete surface having a total area at least three times the area of the loaded portion, may be taken at 37½ per cent. of the ultimate strength of the concrete, when all other stresses are properly provided for.

Compressive stress in steel as specified in Sections 406-407-408 and 409, or in the ratio of the moduli of elasticity of steel to concrete.

In continuous beams the extreme fibre stress in concrete in compression may be increased 15 per cent. adjacent to the supports.

In proportioning the section of concrete for shearing stresses, the effective depth from center of compression area to center of steel shall be used.

Stresses in concrete mixed in the proportions of 1:1½:3 in accordance with Section 385 may be increased 20 per cent, in excess of the above stresses.

Idem.

391. *General Assumptions.*—As a basis for calculating the strength of beams and slabs, the following assumptions shall be made:

(a) A plane section before bending remains plane after bending.

(b) The modulus of elasticity of concrete in compression remains constant within limits of working stresses fixed in this Code.

(c) The adhesion between concrete and reinforcement is perfect.

(d) Concrete has no value in resistance to tension.

(e) Initial stress in the reinforcement due to contraction or expansion in the concrete is negligible.

(f) The ratio of the moduli of elasticity of 1:2:4 stone or gravel concrete and steel inflexure shall be taken as 1:15.

(g) The ratio of the moduli of elasticity of 1:1½:3, or gravel concrete and steel inflexure shall be taken as 1:12.

The span length for beams and slabs shall be taken as the distance from center to center of supports, but need not be taken to exceed the clear span plus the over-all depth of beam or slab. Brackets shall not be considered as reducing the clear span in the sense here intended.

Idem.

BENDING MOMENTS OF UNIFORMLY LOADED FLOOR AND ROOF SLABS.

392. *Bending Moments of Slabs Supported on Two Sides.*—The bending moments of slabs due to uniformly distributed loads shall be taken as not less than:

1/8 WL, at center when simply supported.

1/10 WL, at center and continuous support when supported at one end and continuous at the other.

1/12 WL, at center and intermediate supports when continuous over more than two supports.

W=Total distributed dead and live loads.

L=Length of span.

Idem.

393. *Bending Moments of Slabs Supported on Four Sides.*—The bending moments of uniformly loaded slabs supported on four sides and reinforced in both directions shall be taken as:

1/8 WL, at center in each direction when simply supported.

1/10 WL, at center and continuous support when continuous over one support.

1/12 WL, at both center and supports when continuous over two or more supports.

Idem.

394. *Distribution of Loads.*—The distribution of loads on square and rectangular slabs supported on four sides, shall be determined by the following formula:

$$r = \frac{l^4}{l^4 + b^4}$$

in which r=the proportion of the load supported by the transverse reinforcement.

l=length of slab.
b=breadth of slab.

If the length of the slab exceeds 1½ times its width, the transverse reinforcement shall be designed to carry the entire load.

Idem.

Bending Moments of Uniformly Loaded Beams and Girders.

395. *Term Beam Defined.*—The term beam as used in this section shall be understood to include the term girder, unless specific distinction be made.

Idem.

396. *Beams with Simple or Continuous Supports.*—The bending moments of uniformly loaded beams shall be taken as:

1/8 WL, at center when simply supported.

1/10 WL, at center and over continuous support when supported at one end and continuous at the other.

1/12 WL, at both center and supports when continuous over more than two supports.

Idem.

397. *Beams Supporting Rectangular Slabs.*

1. Beams supporting rectangular slabs reinforced in both directions shall be assumed to take the proportions of load as determined by the formula in Section 394.

2. The bending moments of slabs, beams or girders which are continuous for two spans only, shall be taken as ⅛ WL over the central support and 1/10 WL near the middle of the span.

Idem.

General Design Requirements for Beam and Slab Construction.

398. *Special Members.*—The bending moments for slabs or beams with spans of unusual length or due to other than uniformly distributed loads, shall be more exactly computed according to accepted theory.

Idem.

399. *Continuous Floor Construction.*—In contiuous slabs, beams or girders, full provision shall be made for the negative bending moments over the supports by placing sufficient negative reinforcement near the top of the members to resist the stress. This reinforcement shall pass beyond the point of inflection in beams or girders and be anchored in the compression concrete of the member a sufficient distance to develop the full strength of the steel through bond stress. The critical section of continuous construction is over the support.

Idem.

400. *Web Reinforcement in Beams.*

1. Members of web reinforcement in beams shall be designed for diagonal tensile stresses, using the calculated vertical sheering stress as a measure of these tensile stresses. They shall not be spaced to exceed three-fourths of the depth of the beam in that portion where the web stresses exceed the allowable value of the concrete in shear. It shall be assumed that two-thirds of the external vertical shear is provided for by the steel in calculating the stresses in stirrups, diagonal web members, and bent up bars; and the remaining one-third of the shear shall be assumed as taken by the concrete, in accordance with section 390.

2. Web members such as stirrups, when not rigidly attached to the longitudinal steel at both top and bottom, shall be carried around and bent over the longitudinal members or otherwise sufficiently anchored in the compression concrete to develop the tensile stresses existing in them. Diagonal members shall be rigidly attached to the longitudinal steel on the tension side. Stirrups at the ends of continuous girders shall be inverted with the free ends anchored in the compression concrete at the bottom of the beam. The length of stirrups or diagonals embedded in compression concrete shall be sufficient to develop their entire tensile stresses by adhesion.

Idem.

401. *T Beams.*

1. Where adequate bond is provided at junction between slab and beam, and the two are cast at the same time as a unit, the slab may be considered as an integral part of the beam, *provided* its effective width shall not exceed on either side of the beam one-sixth of the span length of the beam, nor be greater than four times the thickness of the slab on either side of the beam; the measurements being taken from line of intersection between slab and beam.

2. In beams with T sections the width of the stem only shall be used in calculating longitudinal shear and diagonal tension. An effective bond shall be provided at the junction of the beam and slab when the principal slab reinforcement is parallel to the beam, by the use of transverse reinforcement extending over the beam and well into the slab.

3. In the design of T beams acting as continuous beams, sufficient compression area shall be provided on the under side at the support, either by the use of properly designed brackets or by embedding additional compression steel in the concrete extending to the point of inflection.

Idem.

402. *Minimum Thickness of Slabs.*—The minimum thickness of concrete floor slabs shall be 4 inches, and for roof slabs 3½ inches.

Idem.

403. *Floor Finish.*—Cement or concrete floor finish shall not be considered in calculating the strength of floor members unless it be laid at the same time they are cast.

Idem.

404. *Composite Floors.*—The design of composite floors consisting of rows of hard-burned terra cotta tile, concrete blocks, sheet steel, or other approved fire resistive material, separated by ribs or beams of reinforced stone or gravel concrete, shall conform to all the provisions of this part so far as they are applicable. The ribs shall be at least 5 inches wide. The tile or blocks shall be regarded only as fillers, and shall not be considered in the design except as dead load. If designed as a T-beam, the slab portion above the fillers shall be at least 2½ inches thick, and shall consist of the same mixture used for the ribs, and shall be cast at the same time; under these conditions it may be considered in the design of the ribs. Tile or concrete block fillers shall be laid with Portland cement mortar joints, and shall be thoroughly wet before the concrete is poured. The protection for steel bars in bottom of ribs shall be the same as for other beams.

To resist expansion stresses, reinforcement bars not less than ½-inch diameter, shall be placed in the concrete at right angles to the ribs and above the fillers, at intervals not exceeding 30 inches.

Idem.

DESIGN OF COLUMNS AND WALLS.

405. *Length of Columns.*—The length of columns shall be taken as the maximum unsupported length.

The unsupported length of columns shall not exceed fifteen times the least side or diameter, and in no case shall the least side or diameter be less than 12 inches. The length shall include any corbel or knee brace attached to the column.

Idem.

406. *Columns Without Hoops.*—Actual compression in reinforced concrete columns without or with less than one per cent. of hoops, bands or spirals, containing not less than one-half of one per cent. nor more than 3 per cent. of vertical reinforcement, secured against lateral displacement by steel ties placed not further apart than 15 diameters of the vertical rods, nor more than 12 inches, shall not exceed more than 450 pounds per square inch on the effective area of the concrete plus six thousand pounds per square inch on the vertical reinforcement. The percentage of reinforcement shall be calculated upon the effective area of the column, which is the area within the reinforcement.

Idem.

407. *Columns with Hoops.*—Actual compression in reinforced concrete columns with not less than one per cent. of hoops or spirals (that is, a volume of steel equal to one per cent. of the volume of concrete within the hoops or spirals for unit length of column) spaced not further apart than one-fourth of the diameter of enclosed column, with not less than one per cent. nor more than four per cent. of vertical reinforcement, shall not exceed 650 pounds per square inch on the effective area of the concrete plus 9,000 pounds per square inch or the vertical reinforcement. The hoops or spirals shall be uniformly spaced, and shall be rigidly attached to at least four vertical bars in each convolution.

Idem.

408. *Structural Steel and Concrete Columns.*—Axial compression in structural steel columns thoroughly encased in concrete having a minimum thickness of 4 inches and reinforced with not less than one per cent. of steel (that is, a volume of steel equal to one per cent. of the volume of concrete within the hoops) equally divided between vertical reinforcement and hoops or spirals spaced not more

than 12 inches apart, may be taken at 16,000 pounds per square inch on the net section of the structural steel, no allowance being made for the concrete casing. The hoops or spirals shall be placed not nearer than one inch from the structural steel, or nearer than 1½ inches from the outer surface of the concrete. The ratio of length to least radius of gyration of the structural steel section shall not exceed 120.

Idem.

409. *Columns Constructed with Special Concrete.*—In reinforced concrete columns the compression on the concrete may be increased 20 per cent. when the fine and coarse aggregates are carefully selected, and the proportion of cement to total aggregates increased to one part of cement to not more than four and one-half parts of aggregate, fine and coarse, either in proportion of one part of cement, one and one-half parts of sand and three parts of stone or gravel, or in such proportions as will secure the maximum density. The unit stress on the vertical reinforcement in such columns shall not exceed twelve times the unit stress on the concrete.

Idem.

410. *Columns Eccentrically Loaded.*—Bending stresses in columns due to eccentric loads, shall be provided for by increasing the section of concrete or steel so that the total unit stress shall not exceed the allowable working stress in flexure.

Idem.

411. *Steel Base Plates.*—Suitable steel base plates or castings shall be provided at the bottom of columns to distribute the loads over the footings, and the vertical reinforcement bars shall bear squarely on these plates, or the reinforcing bars shall be carried down into an enlarged footing to distribute the load through bond stress.

Idem.

412. *Walls.*—Exterior and interior bearing and non-bearing walls of reinforced concrete shall be securely anchored to all intersecting walls, columns and floors, and the allowable compressive stress shall not exceed 250 pounds per square inch. The thickness shall be not less than two-thirds that specified for brick walls, and in no case less than 8 inches. All such walls shall be reinforced with steel running both horizontally and vertically. The amount of reinforcement shall be not less than 1/5 of 1 per cent. of the cross-section of the wall, and shall be equally disposed near each face of the wall;

except that in walls or partitions 8 inches or less in thickness, the reinforcement may be placed as a single layer in the middle. Reinforcement shall not be spaced more than 18 inches apart. Additional reinforcement shall be placed around wall openings, and all vertical and horizontal reinforcement shall be wired or have other mechanical bond at intervals not exceeding 18 inches in either direction.

Idem.

General Provisions for Design of Girderless Floors or Flat Slabs.

413. *Girderless Floors.*

1. Girderless floors or flat slabs consisting of reinforced concrete slabs resting upon columns with flaring heads, with or without drop heads or column caps, and in which no beams or girders are used, except around openings in the floor or along walls, shall be designed in accordance with the bending moment co-efficients and stresses specified in this Code. No empirical formulas based on the results of tests shall be permitted, but the design shall in general be based upon the principles of continuous or cantilever construction as herein indicated.

2. The methods of analysis shall be as follows:

(a) The portion of the slab adjacent to the column shall be considered as a circular plate supported at the center forming the cantilever portion. The remainder of the slab shall be considered as a simply supported portion suspended from the cantilever plates. The cantilever portion shall be designed for a uniform load over its area equal to the live and dead load on the area plus a concentrated load on its perimeter equal to the floor load resting on the suspended portion of the slab. The radius of the cantilever plate shall be the average distance from the center of the column to the points of inflection of the slab.

(b) Or the slab may be considered as consisting of a series of continuous broad, flat, girders, reinforced with bands of steel consisting of rods supported at the top of the slab over the columns and depressed to the bottom of the slab at the center of the span. These bands of reinforcement may be arranged to run in two directions directly from column center to column center; or in four directions, the former bands being combined with reinforcement running diagonally from column to column.

Idem.

414. *Columns for Girderless Floors.*

1. The column capital shall have a diameter or least side at the top in no case less than 0.225 L, where L is the length of side of the square equivalent to the area of the rectangle included between four adjacent columns. The thickness of the column capital at this diameter shall be not less than 1¼ inches. The slope of the column capital shall nowhere exceed an angle of 45 degrees with the vertical.

2. A depressed head or "drop" may be cast above the column capital and the dimensions of this cap shall be not less than 0.4 of the side of the equivalent square panel.

3. The point of inflection shall be assumed $1/6 \sqrt{3L}$ from the center of the column.

4. The width of bands shall be such as to properly cover the panel area, but shall not be wider than 0.4 times the side of the square panel. Where steel is provided in two directions only, the central portion of the panel shall be considered as a slab supported on four sides.

5. Punching shear shall be calculated at the edge of the column shaft and shall not exceed 120 pounds per square inch. In computing shearing stress for the purpose of determing resistance to diagonal tension, a point shall be taken at a distance out from the column capital equal to the effective depth of the slab.

6. Working stresses and co-efficients shall in general comply with Sections 390, and 392 to 397, inclusive, of this Code. In rectangular panels, the long dimension shall not be more than four-thirds times the short dimension. Interior columns shall be capable of resisting the unbalanced bending moment produced by a panel with live load adjacent to a panel without live load. Floor slabs at walls shall be considered as simply supported on walls or wall beams. If the proportion of the slab adjacent to a wall column is assumed as a cantilever, the wall column or pier shall be capable of resisting the unbalanced moment produced by such cantilever. Bars for negative bending moment shall extend at least to the quarter point of the span, and if the bars have a greater diameter than ¾-inch, special attention shall be given to bond and anchorage.

Idem.

Requirements for Reinforcement.

415. *External and Internal Defects.*—All reinforcement shall be free from excessive rust, scale, grease, paint or any coating which would tend to render or destroy the bond between the steel and the

concrete. Bars shall also be free from injurious seams, slivers, flaws, and other mill defects. The weight of any lot of bars shall not vary more than 5 per cent. from the standard weight of the lot as given by manufacturers' handbooks.

Idem.

416. *Placing and Spacing of Reinforcement.*—All reinforcement shall be accurately located and mechanically secured against displacement during the placing of the concrete. Reinforcement bars for slabs shall not be spaced farther apart than two and one-half times the thickness of the slab. The spacing of parallel bars in beams shall be not less than three diameters from center to center, nor less than one inch. The clear spacing between two layers of bars shall be not less than one inch. In restrained or cantilever construction reinforcement shall extend beyond the supports into adjacent construction for full and effective anchorage, except that when this is not practicable, anchorage shall be obtained by other means acceptable to the Supervisor. Special reinforcement shall be provided to resist concentrated loads. Slabs reinforced in one direction only, shall have shrinkage rods not less than ¼-inch in diameter placed above the reinforcement and spaced not over 2 feet apart. All reinforcement shall be assembled well in advance of the placing of the concrete, and shall be inspected and approved by the Supervisor before concrete is deposited.

Idem.

417. *Protection for Reinforcement.*—Steel reinforcement shall have a minimum protection of concrete on all sides as follows:

In columns and girders, 1½ inches in beams and walls, 1½ inches; and in floor slabs ¾-inch.

The steel in footings for walls and columns shall have a minimum protection of 3 inches of concrete.

Idem.

418. *Splices in Reinforcement.*—Splices in reinforcing bars shall be designed to transfer the calculated stress at the joint either by bond and shear through the concrete, or by bearing between the steel. Splices at points of maximum stress shall be avoided where possible. Lap splices of bars shall be of sufficient length to develop to required stress in the joint without exceeding the bond stress permitted. In columns where necessary to splice vertical bars having areas in excess of 1¼ square inches, it shall be done by cutting the bars squarely at

the ends and enclosing them in a close-fitting pipe sleeve, or uniting them by a threaded splice or other mechanical connection that will transfer the load from one to the other without stressing the adjoining concrete excessively. The middle point of such splices shall be within one foot above the floor level. Splices in column hooping where necessary, shall be sufficient to develop the full strength of the hooping.

Idem.

Workmanship for Concrete.

419. *Mixing.*

1. The separate ingredients of concrete shall be accurately measured, and thoroughly mixed in a manner to produce a homogeneous mass of uniform color and of such a viscous consistency that it will flow to all parts of the forms without separation of the coarse aggregate from the mortar.

2. Except when limited quantities are required, or when the conditions of the work make hand-mixing preferable, mixing shall be done in a mechanical batch mixer from which a complete batch shall be discharged before another is received. All ingredients shall be mixed together for at least one minute, the mixer making at least 20 revolutions. The speed of the mixer shall not exceed 20 revolutions per minute. In all cases, the mixing shall be continued until the consistency is constant.

Idem.

420. *Depositing Concrete.*

1. Concrete shall be deposited, thoroughly tamped and worked to place before initial set begins, and shall then be kept free from shocks and disturbances of every kind until it has fully hardened. Retempering of concrete after its initial set shall be prohibited.

2. When the work of placing concrete is suspended, all necessary grooves for joining future work shall be made before the concrete sets.

3. Before depositing new concrete upon concrete already set, the contact surfaces shall be roughened, cleaned of all laitance and loose material, and then drenched with water and slushed with a grout consisting of one part Portland cement and not more than two parts fine aggregate immediately before placing the fresh concrete. If a watertight joint is desired, or if granolithic is to be deposited on old concrete, it is necessary that a neat cement grout be used.

Idem.

421. *Drying and Freezing.*

1. When fresh concrete is exposed to rapid drying conditions, precautions shall be taken to keep it moist for a period of at least seven days after being deposited. Where practical, this shall be done by covering of wet sand, burlap or some other equally effective method. Thorough wetting twice a day is recommended.

2. In freezing weather all materials used in making concrete, particularly the coarse aggregate, shall be heated, and precautions shall be taken to prevent the concrete freezing while being deposited; and thereafter it shall be kept above 40 degrees until the concrete has obtained its final set, but such period shall be not less than 72 hours.

Idem.

422. *Joints.*

1. Construction joints shall be avoided wherever practicable, but when they are necessary they shall be located at such sections as will least affect the structural strength and shall be made at right angles to the direction of principal compressive stress. In members of floor systems, joints shall be made within the middle third of the span where practicable. In columns, joints shall only be permitted at the bottom face of the lowest connecting floor members. Temperature changes and shrinkage during setting necessitate joints in independent walls at intervals of 50 to 80 feet when not otherwise provided for by effective reinforcement.

2. Girders, beams, and slabs shall not be cast upon freshly formed columns until a period of 4 to 6 hours have elapsed to permit settlement.

Idem.

423. *Construction of Forms.*

1. Forms shall be substantial and unyielding, and care shall be exercised to make them as nearly water-tight as practicable.

2. Care shall be taken to insure that all debris is removed from forms, and that they are thoroughly greased or wetted before concrete is deposited in them. Beam forms shall be so designed that at least one side may be removed without disturbing the bottom portion of the forms and its supports; and column forms, so that they may be removed without disturbing beam and slab forms. Cleanout holes shall be provided in the bottom of column forms where necessary to insure the removal of wood chips or other debris.

Idem.

424. *Removal of Forms.*

1. The time for the removal of forms shall always be subject to approval by the Supervisor.

Schedule.

Bottom of slabs, spans of 6 feet ..... 4 days
Plus 1 day extra for each additional foot of span.
Bottom of beams and girders of ordinary length .....14 days
Beams of span of 20 feet .....21 days
Sides of lintels, girders and beams ..... 3 days
Columns ..... 3 days
Thin walls ..... 3 days

2. Girders of 25-foot span or over shall be considered as special cases and shall be subject to the inspection of the Supervisor before removal of supports.

3. Composite floors, same as for ordinary beams.

4. All reinforced concrete shall be carefully inspected to insure its soundness and reliability before main supports are removed.

5. No loads shall be placed upon a reinforced concrete floor before the removal of the form supports, which would in any way tend to overstress such supports or those below.

6. Special care shall be observed in removing forms when the concreting has been done in cold weather. Concrete which has frozen accidentally before setting, shall be thawed and kept thawed until it is determined whether the cement will set. In this case, sufficient water shall be provided for the cement to hydrate during this action.

Idem.

425. *General Requirements for Tests.*—All tests upon reinforced concrete materials or construction shall be made in accordance with the requirements of Section 390.

Idem.

426. *Inspection.*—Every reinforced concrete building shall be erected under the constant supervision of a reputable and competent inspector furnished by the owner or architect, and acceptable to the Supervisor of Buildings. It shall be the duty of the inspector to keep a daily record of the work done, to observe whether the materials employed, and the methods of construction are in all respects in accord with the specifications filed with the Supervisor, and the requirements of this Code; and to make record of all variations there-

from. A copy of these daily reports shall be filed with the Supervisor who is empowered to stop any improper construction until its faults are corrected, or to cause the removal of any defective work which he may consider dangerous.

A set of plans shall be on file at the building upon which the Supervisor may mark in ink the progress of the work, and state the time and dates on which concrete for each portion of the structure was deposited; and the Supervisor may indicate thereon the date upon which the forms may be removed. Record shall also be made of the date upon which forms were actually removed.

Idem.

PART XXVII.

Reinforced Concrete for Fireproofing.

427. *Approved Construction.*

1. Concrete is approved for all fire-resistive construction, also for the protection of steel structural members, or for any other fireproofing purposes in any building.

2. Any system of reinforced concrete construction may be approved for the construction of floor or roof panels, or partitions in skeleton frame or any other type of fire-resistive building, *provided* that the unit stresses in the materials do not exceed those specified in this Code as permissible for use in such design; and that the concrete and the construction conform to the various other requirements herein specified for such use, including the fire test.

Idem.

428. *Mixture.*—Concrete for fireproofing purposes shall consist of a mixture of viscous consistency of one part Portland cement to not more than seven parts of fine and coarse aggregate by volume. The aggregate shall be mixed in the ratio of two parts of fine to not more than five parts of coarse, or in such proportions as will give the densest mixture.

Idem.

429. *Aggregates.*—Fine aggregates shall be of quality described in Section 387.

Coarse aggregates shall consist of gravel, crushed stone, hard-burned brick, terra cotta, slag, or steam boiler cinders, and shall be clean, hard, and free from deleterious material. All aggregates shall be sized to pass a 1-inch screen and be retained upon a ¼-inch screen, and shall be reasonably dry when screened.

Idem.

430. *Manipulation.*—Concrete for fireproofing shall be mixed, deposited and protected in accordance with the requirements of Sections 419 to 424, inclusive, of this Code.

Idem.

431. *Reinforcement.*

1. The steel reinforcement in concrete used for fireproofing shall be of quality required by Section 389, and the installation shall be in accordance with the specifications of Section 416. The longitudinal members in mesh reinforcement shall not be spaced more than 4 inches center to center, and the least dimension of mesh opening shall be 2 inches. Mesh metal fabrics of all kinds shall have a side lap of not less than 3 inches.

2. All reinforcement essential to secure the required strength of arches or slabs, shall be fully embedded in the concrete, and shall have a protection of at least 1 inch of concrete on the under side.

3. Exposed metal centering or exposed metal of any kind shall not be considered a factor in the strength of any part of any concrete construction subject to fire; and a plaster finish applied over the metal shall not be accepted as sufficient protection.

Idem.

432. *Cinder Concrete.*

1. Cinder concrete may be used constructively as fireproofing, only for floors and roofs between steel beams, and for interior non-bearing walls or partitions.

2. Cinders shall be composed of hard, well burned vitreous clinker, free from sulphides, fine ashes and foreign matter. The use of gas-house, or locomotive cinders, or stove or heating furnace ashes, is prohibited.

3. In the selection of cinders for concrete, care shall be exercised to insure that they carry only a small percentage of unburned coal or coke. The amount shall not exceed 15 per cent.

4. Cinder concrete in the proportions of 1:2:5 to qualify for use for fireproofing, except when used as fill above the floor arch proper,

shall develop an average crushing strength of not less than 800 pounds per square inch at 28 days, when tested in accordance with the method of test prescribed for stone concrete in Sections 312 and 385.

5. The allowable extreme fibre stress in compression in cinder concrete slabs between steel beams shall not exceed 300 pounds per square inch. The ratio of the moduli of elasticity of 1:2:5 cinder concrete and steel shall be taken as 1 to 30.

Idem.

433. *Design Factors for Special Concrete.*—The allowable working stresses and moduli of elasticity for concrete composed of aggregates other than stone, gravel, or cinders, shall be determined by the Supervisor from results of actual tests.

Idem.

434. *Floor Systems Approved on Design.*

1. Segmental concrete arches or flat slabs shall be approved for fireproofing if designed and constructed in accordance with the requirements of Parts XXVI and XXVII insofar as they are applicable; but the permissible stresses for cinder concrete shall be taken as specified in Section 432.

2. The span of concrete arches or slabs for fireproofing shall be taken as the distance center to center of the supporting steel beams, and shall not exceed 8 feet unless the coarse aggregate in the concrete be either stone or gravel, in which case the span shall be limited by the design.

3. The minimum thickness of arches or slabs of cinder concrete for floor and roof construction, shall be 3½ inches, and in no case less than one-eighteenth of the span length between supporting beams.

Idem.

435. *Concrete for Principal Bearing Members.*—Except by written permit of the Supervisor, the coarse aggregate in all concrete used in the construction of bearing walls, columns, piers, or girders, shall be stone or gravel.

Idem.

436. *Tie Rods.*

1. Segmental arches shall have a rise of not less than ¾-inch per foot of span, and steel tie rods of proper size, spacing, and location to resist the thrust shall be used. The rods shall be protected as required in Section 375, paragraph 2.

2. In flat arches, if tie rods are omitted, the reinforcement shall be continuous, or the ends of the bars shall be hooked over the beams or otherwise securely fastened to them at intervals not exceeding 3 feet.

Idem.

437. *Concrete Fill.*—Concrete for fill shall consist of one part cement and not more than ten parts of aggregate. Aggregate shall be as specified in Section 387-388. All concrete fill shall be well mixed, thoroughly wet, tamped to place, and brought to a level at the required height. See Section 374, paragraph 2.

Idem.

438. *Protection for Steel Structural Members.*—Concrete used as fireproofing upon structural steel members shall have the quality, thickness, and be anchored as specified in Section 376.

Idem.

PART XXVIII.

Fire Tests of Construction.

439. *Specifications for Fire Tests.*

1. None but approved materials or methods of construction shall be used in the erection of fireproof buildings.

2. Fireproof construction and protective devices to qualify for use under test, shall meet the requirements of the following specifications:

3. Fire Tests for Floors. The fire test for floors shall be made on at least one full size span, and shall be continuous for four hours at an average temperature of 1,700 degrees F. In this and all other respects the floor to be tested shall meet the requirements of the current specifications of the Standard Test for Fireproof Floor Construction prescribed by the American Society for Testing Materials; or the specifications for such test employed at the Laboratories of the National Board of Fire Underwriters.

4. Fire Test for Partitions. The fire test for partitions, other than those used for shaft enclosures, shall be continuous for two hours, the temperature rising to 1,700 degrees F. in one-half hour, and averaging 1,700 degrees F. for the balance of the test. In this and all

other respects the partition to be tested shall meet the requirements of the current specifications of the Standard Test for Fireproof Partition Construction prescribed by the American Society for Testing Materials; or the specifications for such test employed at the Laboratories of the National Board of Fire Underwriters.

5. Fire Test for Stair and Elevator Shaft Partitions. The fire test for partitions used to enclose stair, elevator and other large shafts shall be continuous for three hours with an average temperature of 1,700 degrees F., for the last two and a half hours of the test, and shall in all other respects conform to the requirements for fire test for partitions given in paragraph 4 of this section.

6. Fire Test for Doors and Shutters. The size of the test sample shall conform to the dimensions required for the maximum size of wall opening for which the device is designed up to and including 5 feet by 7 feet, and shall be mounted and hung in every respect as for ordinary service. It shall be subjected to a continuous fire upon one side for at least one hour, the temperature increasing to 1,800 degrees F. within 30 minutes and then rising gradually to a final temperature of 2,000 degrees at the end of the hour. Immediately after the expiration of the fire test, while the door is still red hot it shall be subjected to a stream of water from a 7/8-inch nozzle 20 feet distant from the door and under a pressure of 60 pounds per square inch at the nozzle. The stream shall be kept moving over the test sample for one minute.

A door to successfully pass this test shall not develop serious structural weakness; shall prevent the development of flame on the unexposed side of the door which extend more than a few inches from the door surface; the heat transmitted through or around the door shall not be sufficient to ignite burlap or similar combustible material placed 36 inches back from the door in a room surrounding the unexposed side of the door.

7. Fire Test for Windows. The size of the test sample and the character of the test shall be the same as that prescribed for doors, except that the temperature shall rise gradually throughout the test to a maximum of 1,500 degrees F. at the end. The application of water shall be the same as for doors. A test to be successful shall meet the requirements specified for doors, as to structural weakness and passage of flame, but no restriction shall be made as to the amount of heat transmitted through the window; furthermore, small portions of glass dislodged by application of the stream of water shall

not be considered as structural weakness. The size of wired glass panel in either window or door shall not exceed 720 square inches.

8. Fire Test for Approved Fire-Resisting Roofing. The roofing shall at least withstand the attack of burning fire brands for 5 minutes with a wind pressure of 5 miles per hour, without ignition of a clear dry white pine decking beneath it; and shall not crack and expose the decking, nor slip badly, nor convey or communicate fire badly, nor produce a serious flying-brand hazard when thus exposed. The test shall be made with the sample at the maximum angle of inclination advocated in practice. The brands shall consist of at least ten strips of seasoned hard maple 2 inches square and 3 feet long, formed into a frame or grid with a 1¾-inch space between them. The complete grid shall be thoroughly ignited and burning before application to the roof sample, which latter shall extend on all sides at least 18 inches beyond the edges of the grid.

9. The first-resisting properties of any material or construction other than those already described in this section shall be determined by such tests as meet the approval of the Supervisor.

Idem.

PART XXIX.

Strength Test for Floor Construction.

440. *Test of Sample Floor Panel.*

1. Any system of fireproof floor construction intended for use between steel beams which is not susceptible of analysis and computation according to the rules of design, may receive approval for use for spans not exceeding 8 feet, on the basis of an ultimate load test as follows:

2. The test shall be under the direction of the Supervisor and shall be made upon a section of flooring not less than 4 feet wide, and of a span corresponding to the proposed construction. The test load shall be applied at points or loading areas located at the third points of the span. Each loading area shall consist of a zone of the slab surface not exceeding 1 foot in width, and of a length corresponding to the width of the test slab. Rigidity of the steel framework may be secured in any manner acceptable to the Supervisor, but in

all cases one end of the test panel shall be constructed to reproduce the conditions of an outside or end panel in a building.

A loose sand bed not over one inch thick may be provided between the floor and the load. Approved methods shall be used for applying the test load and measuring the deformations. The load shall be applied gradually, and a complete record of loads and deformations shall be kept throughout the test. The allowable working load shall be one-sixth the total load causing failure, thus providing for a factor of safety of approximately eight on the basis of a uniformly distributed load.

3. The Supervisor shall keep record of all details of test construction, and approved construction shall thereafter be installed in every respect in accordance with said record.

4. The application of a test load to a segmental arch may vary from the method given in paragraph 2 if necessary, but any change shall be approved by the Supervisor, and care shall be taken to avoid possibility of arching in the load.

5. If for reasons stated in paragraph 1 a floor panel composed of cinder concrete, or concrete made from other fireproofing materials, is entitled to a test for approval; or if the methods or results of calculation for such a floor system are unsatisfactory to the Supervisor, he may require a confirmation test. In either case the test shall be applied in the manner stated in paragraph 2, except that if the system is installed in practice with both ends of the floor panel freely supported, it shall be so tested; if installed in practice with both ends of the reinforcement securely anchored to the supporting beams, it shall be so tested. In each case an adjoining span may be built at one end, of the same length and thickness as the test span. If the reinforcement consists of wire mesh or similar material installed by laying the mesh continuously over the supporting beams, it shall be considered as a condition affording only partial restraint, and the test construction shall be installed as follows: One end of the test section shall be freely supported on the steel beam, and the other end made continuous by installing a span equal to the test span in length and thickness, and embedding the reinforcement therein in the usual manner.

The test construction shall be 30 days old on the day of the test.

Idem.

441. *Test of Systems of Construction.*—When a construction engineer, contractor, or builder proposes new methods or principles

in combining concrete, steel or other structural materials, not provided for by this Code; or designs a construction in which the stresses are indeterminate, he shall furnish for record with the Supervisor plans and specifications giving in detail the construction and calculations used in his design. He shall also prepare a sample portion of the construction and submit it to an ultimate load test in a manner satisfactory to the Supervisor; or the Supervisor may accept satisfactory evidence that such test has been made upon the particular system proposed. Such evidence shall comprise full details of a test and the results, and shall show the deflections and other effects on the construction at all steps during the test. If the test shows that the construction, based on specifications submitted, has a factor of safety of four on total dead and live load, and that the design, stresses, and co-efficients specified by this Code are not exceeded, and it otherwise meets the approval of the Supervisor, he shall issue regulations under which such construction may be used. No such regulations, however, shall have the effect of altering the working stresses and the requirements for fireproofing specified in this Code.

Idem.

442. *Test of Workmanship for Floor Construction.*

1. Whenever the Supervisor of Buildings has doubt as to quality of materials or workmanship in any building, he may require the owner or contractor at his own expense to make such tests as will establish the safety of the construction before certificate of occupancy is issued.

2. The test shall be under the direction of the Supervisor, and shall show that the construction will safely sustain a load equal to twice the live load for which it was designed, for a period of 24 hours without injury or permanent deformation. In the test of a floor arch the load shall be applied to a typical arch of average span between beams. If less than a whole arch between girders is tested, the test section shall be cut apart or isolated from the rest of the arch before applying the load; such test section shall have a width of at least 4 feet measuring parallel to the beams.

3. The load shall consist of such materials and shall be so placed as to form a uniformly distributed load over the entire area to be tested without arching effect. In case sand or similar material is used for loading, it shall be loose in bottomless bins, and not in sacks or packages of any kind. A complete record of loads and deformations shall be kept throughout the test.

4. At least 30 days shall have elapsed after removal of forms from concrete flooring before a test load is applied.

5. If the portion tested should fail to meet the requirement of this test, the Supervisor may still approve the structure for use, and if necessary, tests shall be repeated on different portions to determine the critical load. The detail records of this test, and the results of the tests upon the samples of concrete used in the construction, shall be taken into consideration by the Supervisor in determining the working load to be permitted. However, it shall be specifically understood that no sub-standard construction shall be accepted by the Supervisor, if in his judgment it is sufficiently defective to be unsafe for the purpose intended.

Idem.

PART XXX.

Chimneys, Flues and Heating Apparatus.

443. *Certificate of Compliance.*—Every owner, agent or principal contractor or person properly entitled thereto shall demand of and receive from the bricklayer erecting, remodeling or repairing any chimney or flue in any building or structure, a certificate from the Supervisor that such works comply with the building laws of the City of Nashville, and the said bricklayer shall furnish the said certificate to the said party as aforesaid previous to settlement for the works done.

Idem.

444. *Chimneys, Smoke Flues, Gas Flues and Fireplaces.*

1. All chimneys hereafter erected shall be of brick, concrete or stone, extending at least 3 feet above the point of contact with a flat roof or 3 feet above the ridge of a pitch roof if at the apex or two feet above apex if in center, or at base to be not less than 9 feet above roof and shall be properly capped with terra cotta, stone, cement, cast iron, or other approved incombustible weatherproof material and all mortar shall be as specified in Section 318.

2. The brickwork or reinforced concrete of the smoke flues of all boilers, furnaces, baker's ovens, large cooking ranges, large laundry stoves, and all flues used for a similar purpose shall be at least 8 inches in thickness. Walls of smoke flues used exclusively for ordi-

nary stoves or open fireplaces shall be not less than 4 inches thick. Brick set on edge shall not be permitted in chimney construction.

3. Where two or more smoke flues are contained in the same chimney, the walls between the several flues shall be not less than 4 inches thick, *provided* that not more than two flue tiles may be placed and run side by side without the 4-inch masonry wall between.

4. The walls of stone smoke flues shall be 4 inches thicker than required for brick or reinforced concrete. No smoke flue shall have stove pipe connections in more than one story of the building.

5. Every smoke flue contained in a chimney hereafter erected shall have an area of at least 64 square inches for a stove pipe flue and an area of at least 96 square inches for a fireplace flue, and shall be lined with hard burned fire clay flue lining made smooth on the inside. The flue lining shall start from the bottom of the flue, or from the throat of the fireplace if the flue starts from a fireplace, and shall be carried up continuously the entire height of the flue. The ends of the sections of all such lining tile shall be laid in cement mortar and the tile shall be built in and well flushed as the flues are carried up.

No parging mortar nor plaster shall be used on the inside of any fireplace, chimney or flue.

6. In every building, where one or more smoke flues start from the cellar or lowest story, at least one such smoke flue shall have an internal cross-sectional area of at least 96 square inches and shall start at least 3 feet below the ceiling.

7. In no case shall a chimney be corbeled more than 8 inches from the wall, and such corbeling shall consist of at least five courses of brick. Piers which support chimneys shall start from the foundation on the same line with the chimney breast. They shall be not less than 12 inches on the face and shall be properly bonded into the walls. No chimney shall rest upon nor be carried by woodwork. No combustible furring or sheathing shall be placed against any smoke flue or chimney breast.

8. The walls of flues used only for gas burning appliances shall be of brick or concrete at least 4 inches thick and lined as required in paragraph 4 of this section. Where two or more such flues are contained in the same chimney, the walls between the several flues shall be not less than two thicknesses of the tile lining with joints broken, except that at least every third partition shall be not less than 4 inches thick of brick or its equivalent, and bonded into the walls.

9. The smoke flue of every high pressure steam boiler and every appliance producing a corresponding temperature in the smoke flue, shall, if built of brick, stone, reinforced concrete or other approved masonry, be lined on all sides with not less than 4 inches of fire brick laid in fire mortar for a distance of at least 20 feet from the point where the smoke connection of the boiler enters the flue.

10. Interior vertical smoke stacks or flues for steam boilers or other furnaces, and similar heating devices producing a corresponding temperature, may be of metal not less than No. 10 U. S. gauge, properly riveted, jointed, and braced at intervals of at least 20 feet. Such stacks shall either be enclosed by approved masonry walls not less than 8 inches thick with an air space of at least 4 inches between lining and wall; or if such stacks or flues are not enclosed with masonry they shall have a clearance from all combustible material of not less than one-half the diameter of the stack, but not less than 24 inches, unless the combustible material be properly guarded by loose-fitting metal shields, in which case the distance shall be not less than 12 inches. Where such a stack passes through a wooden framed roof, it shall be guarded by a galvanized iron ventilating thimble extending from at least 9 inches below the under side of the ceiling or roof beams to at least 9 inches above the roof, and the ventilating thimble shall have a clearance of not less than 18 inches, except that for stacks for low grade furnaces such as hot air, hot water, and low pressure steam heating furnaces, coffee roasting ovens, candy furnaces, etc., the clearance may be reduced to 12 inches. Metal smoke stacks shall not be permitted to pass through floors. Smoke flues shall not be permitted inside of vent flues for ranges.

11. Exterior metal smoke flues for boilers, large cooking ranges, and similar heating devices, shall be of approved construction and supported on approved masonry foundations, and shall have a clearance of at least 4 inches from the outside wall. Such flues having an area not exceeding 255 square inches shall be constructed of not less than No. 16 U. S. gauge metal; if the area exceeds 255 square inches, the thickness of the metal shall be not less than No. 10 U. S. gauge.

12. The smoke flue of every smelting furnace and of every other device which heats the flue to an extremely high temperature, shall be built with double walls of thickness suitable for the temperature. There shall be an air space between the walls, and the inside wall shall be of firebrick not less than 4 inches thick.

13. Chimneys of cupola-furnaces, blast-furnaces, and similar devices, shall extend at least 10 feet above the highest point of any roof within a radius of 50 feet, and no woodwork shall be within 3 feet of any part of any such device or its chimney.

14. All fireplaces and chimney breasts where mantels are placed, whether intended for ordinary fireplace use or not, shall have trimmer arches or other approved fireproof construction supporting hearths. The arches and hearths shall be at least 24 inches in width measured from the face of the chimney breast. The arches shall be of brick, stone, terra cotta or reinforced concrete of approved thickness. The length of the trimmer arch and the length of the hearth shall be not less than the width of the chimney unless approved by the Inspector. The hearth shall be of brick, stone, tile or other approved fireproof material. False fireplaces shall only be permitted against unfurred masonry walls.

15. No coal burning heater shall be placed in a fireplace which does not conform to the foregoing requirements and have an incombustible mantel. No wood mantel or other woodwork shall be placed within 8 inches of the side nor within 12 inches of the top of any open fireplace. No combustible summer piece or fireboard shall be used in connection with any open fireplace. The firebacks of all fireplaces shall be of solid masonry not less than 8 inches thick.

16. When a grate is set in a fireplace, a lining of firebrick at least 2 inches in thickness shall be added to the fireback, or soapstone, tile or cast iron may be used, if solidly backed with brick or concrete.

All flue-holes when not in use shall be closed with tight-fitting metal covers.

Idem.

445. *Smoke Pipes.*—No smoke pipe shall pass through any floor, or wall, or roof. Smoke pipes for large cooking ranges, hot air furnaces, low pressure steam or hot water boilers shall be not less than 18 inches below or away from any wooden joist or lath and plaster or other combustible ceiling or wall, the upper half of such smoke pipe to be properly protected by 1 inch or more of asbestos covering or its equivalent, or by a metal casing spaced 2 inches from the upper half of the pipe, or encased with wire lath, then entirely covered with asbestos covering at least 1 inch thick.

Idem.

446. *Heating Furnaces and Appliances.*

1. High pressure steam boilers, bakery ovens or furnaces in which fires are maintained producing a high degree of heat, shall rest on the ground, a trimmer arch, or a fireproof floor constructed in accordance with Section 375.

2. Low pressure heating boilers, coffee roasters, fireheated candy kettles, laundry stoves, coal ranges without legs, and similar appliances where hot fires are used in other than residences, shall rest upon fireproof foundations as above described. However, the Supervisor's written permission may allow them to be placed upon wooden floors if the floors are protected by sheet metal or a 1/8-inch layer of asbestos covered with not less than 4 inches of masonry set in cement mortar. Such masonry shall consist of one course of 4-inch hollow terra cotta, or of two courses of brick or terra cotta, at least one of which shall be hollow and be laid to preserve a free circulation of air throughout the whole course. Concrete may be substituted for a course of solid brick if desired. The masonry work shall be covered by sheet metal of not less tha No. 26 gauge, so arranged as not to obstruct the ventilating passages beneath. Such hearths shall extend at least 12 inches on the sides, back and front of the furnace, range or similar heating appliance; if solid fuel is used, the front extension shall be at least 24 inches.

All stoves or ranges with legs shall be set on incombustile material which shall extend at least 24 inches in front when solid fuel is used.

3. Any woodwork or wooden lath and plaster partition within 4 feet of the sides or back, or 6 feet from the front of any such boiler, furnace or heating appliance, shall be covered with metal shields or other approved incombustible material to a height of at least 4 feet above the floor. This covering shall extend the full length of the boiler, furnace, or heating appliance, and to at least 5 feet in front of it. Such metal shields shall be so attached as to preserve an air space behind them. In no case shall such combustible construction be permitted within 2 feet of the sides or back of the heating appliance, or 5 feet in front of same.

4. Heating boilers shall be encased on sides and top by incombustible protective covering not less than 1½ inches thick, and the overhead clearance of such covered boilers and hot air furnaces shall be not less than 15 inches. Any woodwork within 2 feet of the top of such boilers or furnace shall be protected by a loose fitting metal

shield, but such shields shall not be placed so as to form concealed spaces.

Idem.

447. *Stoves and Ranges.*

1. No kitchen range or stove in any building shall be placed less than 3 feet from any wooden wainscot, unless the woodwork is properly protected by metal shields, in which case the distance shall be not less than 18 inches.

2. Hotel and restaurant ranges shall be provided with a metal hood placed at least 9 inches below any wooden lath and plaster or wooden ceiling, and have an individual pipe outlet connected with a flue in accordance with the requirements of Section 450. The pipe shall be protected by at least 1 inch of asbestos covering, or its equivalent.

3. No furnace, boiler, range or other heating appliance shall be placed against a wall furred with wood.

Idem.

448. *Vent Pipes.*—All stone, or brick, or hot air flues in vertical walls shall be lined with tin or other suitable sheet metal or burnt clay pipe.

Idem.

449. *Steam and Hot Water Pipes.*—No steam or hot water pipe shall be within 1 inch of any woodwork. Every steam or hot water pipe passing through combustible floors, or ceilings, or wooden lath and plaster partitions, shall be protected by a metal tube 1 inch larger in diameter than the pipe and be provided with a close-fitting metal cap on each side of the floor or partition. The pipe shall be kept at least 1 inch away from woodwork. Steam and hot water pipe coverings shall be of asbestos or other incombustible material.

Idem.

450. *Vent Flues and Ducts.*

1. Vent flues or ducts for the removal of foul air in which the temperature of the air cannot exceed that of the room, may in non-fireproof buildings, be constructed of sheet metal or other incombustible material. When used in connection with an exhaust fan, such duct shall not be placed nearer than 1 inch to any woodwork. All such ducts shall open to the outside of the building.

2. All openings into such vents or ducts shall be protected by automatic or self-closing fire doors, or by automatic closing metal louvres or dampers.

3. Vent flues and ducts connected with hoods over restaurant ranges shall be constructed in accordance with the requirements for smoke flues, Section 444, and for smoke pipes, Section 445, and shall be used for no other purpose.

4. All ducts from blower heating and ventilating systems (dwellings excepted) which pass through stories shall be made of or protected throughout by approved fire-resisting material not less than 3 inches thick if of brick, block, or tile; or 2½ inches of solid metal lath and cement plaster. Where such ducts serve more than one story, automatic dampers shall be provided on all outlets opening directly from such ducts and at all connections with branch ducts.

Idem.

451. *Dry Rooms.*—No combustible materials shall be permitted in the construction of any dry room in which a temperature of 125 degrees F. or over may exist. If a temperature under 125 degrees F. is to be used, the dry room may be constructed of wood, but shall be lined throughout with ⅛-inch asbestos or ¼-inch plaster board and covered with sheet metal; or the covering may consist of metal lath or plaster board, plastered to a total thickness of at least ⅝-inch. Cement plaster or cement-tempered plaster shall be used.

Idem.

PART XXXI.

Existing Buildings Raised, Altered, Repaired or Moved.

452. *Buildings Raised, Altered, Repaired or Moved.*

1. Within the fire limits every existing building having a combustible roof, if raised to produce an additional story, shall be provided with an incombustible roof.

2. No building within the fire limits having masonry walls shall be enlarged or built upon unless the addition to the exterior walls be of approved incombustible materials.

3. No existing building shall be altered to exceed the limits of height or area provided by this Code for new buildings of the same class as that to which the additions are made.

4. No existing frame building shall be raised to a height exceeding 30 feet, except that dwellings occupied by not more than one family, may be raised to 35 feet. Buildings so raised shall comply with all the requirements of this Code relating to frame buildings.

5. Within the fire limits no frame building more than two stories in height shall be altered to be used as a factory, warehouse or stable.

6. No frame building within the fire limits shall be increased in area by frame additions, except that frame extensions to be used exclusively for toilet purposes may be permitted, but any such extension shall have an approved roof covering.

7. Any frame building which may hereafter have the first story converted into a store, shall have the walls, partitions and ceiling of such first story covered with metal lath or ¼-inch fibre plaster board and plastered to a total thickness of at least ⅜-inch; or the plaster board may be covered with sheet metal. Fire stops shall also be provided at the line of the ceiling to cut off all connections to stories above through hollow stud partitions or side walls.

8. Any existing frame building within the fire limits which may hereafter be damaged by fire, decay or otherwise to an amount greater than one-half of its value exclusive of the foundation, shall not be repaired or rebuilt, but shall be immediately condemned and removed.

9. No frame building shall be removed from without to within the fire limits.

10. No building shall be moved until a permit has been obtained from the Supervisor, and he shall not issue such permit if in his judgment the proposed new location of the building would seriously increase the fire hazard of the surrounding buildings.

Idem.

PART XXXII.

Frame Buildings.

453. *Permissible Wooden Buildings or Structures within Fire* Limits.—No frame building or structure shall be erected within the fire limits except the following; and all roofs placed upon such buildings or structures shall have approved covering:

(a) Temporary one-story frame buildings for use of builders, and temporary stands, platforms, booths and tents, for which permits shall be obtained from the Supervisor. Such frame structures for use of builders in connection with the erection of a new building shall be removed as soon as the building is completed; other temporary frame structures shall be removed as soon as they have ceased to serve the original purpose for which they were permitted;

(b) One-story sheds open on all sides and not over 12 feet high, and with an area not exceeding 500 square feet. A wooden fence shall not be used to form the back or side of such sheds or any other structure;

(c) Wooden fences not over 7 feet high;

(d) Piazzas or balconies not exceeding 16 feet in width, nor extending more than 3 feet above the second-story floor beams except in residences. No such structure shall extend beyond the lot line, or be joined to any similar structure of another building;

(e) Bay windows when covered with incombustible material, and as limited by Section 365, paragraph 4;

(f) Small outhouses not exceeding 400 square feet in area and one story, or 12 feet, in height;

(g) Outhouses shall not be less than two feet of any lot line, nor less than 30 feet from any other building over one story high.

Idem.

454. *Frame Buildings Outside of Fire Limits.*

1. No frame building shall exceed two stories, except that dwellings occupied by not more than two families may have two and one-half stories. The attic in a two-and-a-half-story house may be used for sleeping rooms, but not for living purposes. No family shall be domiciled above the second story. A church spire may be constructed of wood to a height not exceeding 75 feet from the ground, but such spire shall not be placed nearer any other building or structure than the equivalent of its height measured from its masonry support to the pinnacle.

2. All frame buildings or structures shall have approved roof coverings as herein provided.

3. No frame building erected for any occupancy other than buildings of Class F, shall cover a ground area exceeding 5,000 square feet, except as restricted in paragraph 4; except also that a frame

building equipped with an approved system of automatic sprinklers, may have an increase in area of 66 2/3 per cent, or 8,333 square feet.

4. Frame buildings of Class F, and frame buildings of other classes having an area exceeding 5,000 square feet without sprinklers, shall not be placed within 35 feet of any side or rear lot line; and if the area exceeds 7,500 square feet, the distance from a side or rear lot line shall be not less than 100 feet.

5. The combined area of frame buildings, sheds and outhouses located on any lot shall not exceed 80 per cent. of the lot area.

6. In no case shall a frame building with wooden siding be erected or altered to extend nearer than 3 feet of the side or rear lot line.

7. Floor beams and rafters in frame buildings shall be not less than 2 inches in thickness. All frame or wood buildings exceeding 15 feet in height shall have their sills secured to the foundations in a secure manner and be erected with sills, posts, girts, and plates of suitable size and materials with proper framing and braced with studs at all angles, but this shall not prohibit the use of balloon framing with proper sills and ribbon strip not less than 1¼x4 inches where diagonal sheathing is used, and provided that the outside walls are fire stopped at each floor level as required by Section 457, paragraph 3.

Idem.

455. One-story frame dwellings and outhouses may have foundations of cedar posts set not less than eighteen inches in ground on 18x18-inch stone bases, or on brick or concrete piers not less than 12x12-inch, none of which shall be over eight feet on centers.

2. Under no circumstances shall the foundation of any brick or stone building be built upon filled or made earth unless approved footings be constructed.

3. All buildings except as above stated shall have foundations of brick, stone or reinforced concrete.

4. Where metal is incorporated or forms part of the foundation, it shall be thoroughly protected from rust by paint, concrete or other approved methods of protection.

5. Foundations for all chimneys or flues shall be of brick, stone or concrete.

6. All foundation walls not resting on solid rock shall be provided with footing properly proportioned to carry the super-imposed

load on the soil where they are used. And in all cases where concrete foundations are used in clay or dirt soil a footing 12 inches wider than the thickness of the foundation wall proper shall be provided.

7. Foundation walls of hollow building blocks shall be not less than 12 inches thick in any part, and shall be constructed as specified in Section 273, paragraph 4.

8. Footings and foundation walls shall be laid in cement mortar.

Idem.

456. Provide and set cast iron air grates at intervals of 16 feet in all outside foundation walls.

Idem.

457. *Walls and Partitions in Frame Buildings.*

1. In rows of one-story frame houses used by separate families the dividing walls or partitions between houses shall preferably be built of brick, terra cotta, concrete or other approved incombustible material; or they may be built of wooden studding. Such dividing partitions if of masonry shall rest on masonry walls or if of studding, on wooden girders. In rows of more than three houses, every alternate division wall or partition shall be constructed of brick or concrete not less than 8 inches thick. These walls shall extend from front to rear, be solid without openings, and shall extend at least 2 feet above the roof, and be coped. If such parapet be of concrete, or if the top six courses of brick be laid in Portland cement, the coping may be omitted.

2. The ends of floor beams entering such walls from opposite sides shall be so staggered or separated that there shall be not less than 4 inches of masonry between the beams where they rest on the walls.

3. Timber posts and girders or other approved supports may be used instead of brick fore and aft partitions, in cellars of frame buildings.

4. In all frame buildings which are to be lathed and plastered or otherwise sheathed on the inside, all stud walls shall be completely fire-stopped with suitable wooden fire blocking at each floor level. Partitions which rest over each other shall be fire-stopped as required in Section 360, paragraph 3. The fire-stopping shall be arranged to cut off all concealed draft openings, and form an effectual horizontal fire barrier between stories or floor and ceiling lines.

Idem.

458. *Partitions in Old Stores, Etc.*

1. Where it is desired to construct temporary dividing or partition walls in the first story of a store or business house already built, and it is impracticable to construct brick, concrete or hollow tile division walls (as for example the separating of one store room into two or more stores with or without cross walls or separate front entrances in a building already constructed);

2. It is lawful to erect a non-bearing stud wall with block bridging six feet apart, using metal lath or fireproof plaster board and cement plaster on each side;

3. Or a fireproof wall of steel ribbed lath;

4. Or a plastic wall of gypsum bar;

5. Or a similar class of construction with cement plaster on each side;

6. But no such walls shall be constructed of tongued and grooved plank, or similar woodwork, or of sheet metal, or of beaver board, or a similar paper fibre product in this or any other class of business houses, hotel, apartment, flat, or office, or where people room or sleep;

7. *Provided,* that walls of sash and glass with wooden bases not over five feet high may be erected within stores or offices, but not for separating one business from another business where goods or materials are stored or on sale;

8. And further *provided* that porches on residences in the second and third zones may be enclosed with walls of sash and glass with base not over five feet high of studding with metal lath and stucco outside and plastered or ceiled up to sash line inside;

9. And no wall shall extend above top line of base except it be of glass and sash as herein provided and not over eight inches of woodwork shall be placed between such sash.

Idem.

PART XXXIII.

Standpipe Requirements.

459. 1. In existing buildings not already provided with a 2-inch standpipe for private protection or a 2½-inch or larger standing pipe for fire department use, and in buildings hereafter erected, except as given below, there shall be provided:

For buildings not more than three stories, or 40 feet in height, standpipes for private protection not less than 2 inches in diameter.

For buildings four stories, or 55 feet in height, to six stories, or 75 feet in height, standpipes for fire department use not less than 2½ inches in diameter.

For other buildings in excess of six stories, or 75 feet in height, standpipes for fire department use not less than 3 inches in diameter.

Exceptions:

Sprinkled buildings where the requirements of this section are met by connecting hose to sprinkler riser.

Other buildings having maximum undivided fire section of less than 2,500 square feet area and provided with at least one 2½-gallon approved chemical extinguisher to each fire section.

Dwellings.

Churches.

Buildings not over one story high having hydrants (within 150 feet of all parts of buildings) housed and provided with one 150-foot length of standard 2½-inch hose attached, with 1-inch nozzle, wrenches, etc., with pressure not less than 25 pounds, allowing a full flow through a 2½-inch outlet.

2. The location of all necessary standpipes shall be as directed by the Supervisor of Buildings and the Chief of the Fire Department.

3. Where more than one standpipe is required in a building they shall be connected at their bases by a pipe of equal size to that of the largest standpipe.

4. All standpipes shall extend from the cellar to and through the roof with hose connection and gate valve not over 6 feet above level of each story, including cellar, and two hose connections and gate valve for each on the roof. All connections to standpipes for private protection shall be 1½ inches in diameter and those for fire department use 2½ inches in diameter.

5. Where standpipes are located inside of building, hose sufficient to reach to all parts of fire section, but not in excess of 100 feet, shall be attached to each outlet, with hose for roof hydrant either in hose hydrant room on roof or on rack in top story near roof scuttle. Hose to be used by Fire Department shall be not less than 2½ inches in diameter and be provided with standard couplings in use by the local Fire Department. Hose to be used in connection with standpipes for private protection shall be 1½ inches in diameter.

6. Hose to be used in connection with standpipes for fire department use shall be approved cotton rubber lined and that for private protection use approved linen made under specifications recommended by the National Board of Fire Underwriters. All hose shall be in 50-foot lengths, the linen hose being properly racked, and the cotton rubber-lined hose installed on a reel.

7. Eash line of hose shall be provided with washers at both ends, and be fitted with smooth bore brass play pipe or nozzle at least 12 inches long, the nozzle for Fire Department use having a discharge outlet 1⅛ inches in diameter and that for private use ⅝ of an inch in diameter. One spanner to be located at each hose connection.

8. Standpipe shall be wrought iron or steel, galvanized, and those for Fire Department use, together with fittings and connections, shall be of such strength as to safely withstand at least 400 pounds of water pressure to the square inch when ready for service, without leaking at joints, valves or fittings; such tests may be made by the Chief of the Fire Department.

9. Standpipes for private protection shall be provided with an auxiliary water supply where the city pressure is less than 25 pounds at hose outlet in top story. This auxiliary supply shall be provided by the installation of a gravity tank of not less than 2,500 gallons capacity for each riser, same to have an elevation of at least 20 feet above roof; or steel pressure tank of not less than 3,750-gallon capacity for each riser, kept 2/3 full of water and 1/3 full of air under pressure of not less than 75 pounds and located not lower than highest outlet of standpipe; or automatic pump of at least 200 gallons per minute capacity.

10. Standpipe for private protection shall be connected to the City water main or other source of supply through cast iron pipe at least 1 inch greater in diameter than the riser. The size of this connection shall be increased ½-inch in diameter for each additional riser over one.

11. Standpipes for Fire Department use shall be connected to a two-way Siamese steamer connection outside of the building by a pipe of diameter equal to that of the largest standpipe supplied. Such connection shall be made on each street front, except that corner buildings having one street frontage of less than 50 feet may have only one connection. Siamese shall be about one foot above the curb level, and shall be provided with check valves, and substan-

tial caps to protect thread on the connection; the thread shall be uniform with that used by the local Fire Department. A suitable iron plate with raised letters shall be provided, reading: "To Standpipe."

12. Fire pumps, permanently connected to the standpipe system, shall be provided for buildings eight stories or more in height, and in any building in excess of 10,000 square feet area, with capacities as follows:

A. One 2½-inch standpipe, pump capacity not less than 250 gallons a minute;

B. One 3-inch standpipe or two inter-connected 2½-inch standpipes, pump capacity not less than 400 gallons a minute;

C. Two 3-inch standpipes, pump capacity not less than 500 gallons a minute;

D. Pump to have an adequate source of power and be supplied from street main or from well or cistern containing at least one hour's full supply; suction piping to be well installed.

Idem.

PART XXXIV.

Sprinkler Requirements.

460. *Sprinklers.*

1. In all new or existing buildings, an approved automatic sprinkler system, so constructed as to protect every square foot of floor area, shall be provided as follows:

(a) In every cellar, basement, or sub-basement, including spaces under sidewalks, used for the manufacture, sale, or storage of combustible goods or merchandise.

Exceptions: Class A, B, C, and D buildings and office buildings, except such portions of cellars, basements and sub-basements as are used for storage purposes or as workshops.

All buildings outside the fire limits and with basement section of less than 2,500 square feet area.

(b) Throughout all buildings having maximum fire area in excess of those permitted in Section 294.

(c) Throughout all buildings of Class E and F, where the height exceeds five stories, except that in office buildings such system shall

be required only in sample, shipping, storage or stock rooms which exceed 1,000 square feet area and contain combustible goods or supplies not stored in enclosed fire-resisting shelving.

(d) Throughout Class E and F buildings over two stories high, used for the manufacture, sale or storage of combustible goods or merchandise, if within 50 feet of other buildings having wall openings not protected as given in Section 351, or if in non-fireproof buildings.

(e) Over all heating furnaces or boilers in Class A, B, C, and D buildings, unless in fireproof rooms, except dwellings.

2. Sprinkler heads shall be a kind approved by the Underwriters' Laboratories, Inc., of Chicago, or by the Associated Factory Mutual Laboratories, of Boston.

3. Sprinkler heads shall be so placed as to thoroughly protect all parts of the area in which they are installed, including spaces under stairs, inside elevator wells, in belt, cable, pipe, gear and pulley boxes, inside small enclosures, such as drying and heating boxes, tenter and dry room enclosures, chutes, conveyor trunks, and all cupboards and closets unless they have tops entirely open and are so located that sprinklers can properly spray therein. Each sprinkler head to protect not in excess of 100 square feet area.

4. The size of riser serving any one floor of one fire area shall not be less than the following, and the number of sprinklers on a given size pipe on one floor of one fire area shall not exceed the following:

Size of Pipe.	*Maximum No. of Sprinklers Allowed*
¾-inch	1 sprinkler
1 -inch	2 sprinklers
1¼-inch	3 sprinklers
1½-inch	5 sprinklers
2 -inch	10 sprinklers
2½-inch	20 sprinklers
3 -inch	36 sprinklers
3½-inch	55 sprinklers
4 -inch	80 sprinklers
5 -inch	140 sprinklers
6 -inch	200 sprinklers

5. Each system shall be provided with an outside screw and yoke gate valve so located as to be readily accessible and to control all

sources of water supply except that from steamer connections. Drain pipes shall be provided, and the system so installed as to drain all parts.

6. A dry pipe system shall be used only when a wet pipe system is impracticable, as in buildings which have no heating facilities.

7. Two independent water supplies shall be provided, at least one of which shall be automatic. *Provided,* that, where sprinklers are required only in cellars, basements, and first stories, a connection to street main will be deemed sufficient.

8. Pressure tanks, if used, shall have a total capacity of not less than 4,500 gallons (3,000 gallons of water), and in any event the tank or tanks shall contain sufficient water to supply 12½ per cent. of the greatest number of sprinklers within a fire area on any one floor for 20 minutes with an average discharge of 20 gallons per minute per sprinkler.

9. Gravity tanks, if used, shall contain an available quantity of water sufficient to supply 25 per cent. of the greatest number of sprinklers in a fire area on any floor to which it gives protection, for 20 minutes with an average discharge per sprinkler or 20 gallons per minute, but tank shall be not less than 5,000 gallons available capacity.

Elevation of bottom of tank above the highest line of sprinklers on the system which it supplies shall be not less than 20 feet.

10. Fire pumps, if used, shall be of not less than 500 gallons capacity per minute, and sufficient to supply 50 per cent of the number of sprinklers within a fire area on any floor with an average discharge per sprinkler of 20 gallons a minute. Pump to have an adequate source of power and be supplied from street main or from well or cistern containing one hour's full supply for the number of sprinklers judged liable to be open by fire at any one time; suction piping to be well installed.

11. The system shall be connected to a Siamese steamer connection outside of the building by a pipe of diameter equal to that of the largest standpipe supplied. Such connection shall be made on each street front, except that corner buildings having one street frontage of less than 50 feet may have only one connection. Siamese shall be about one foot above the curb level and shall be provided with check valves, and substantial caps to protect thread on the connection; the thread shall be uniform with that used by the local fire department. A suitable iron plate with raised letters shall be pro-

vided, reading: "To Basement Sprinkler" or "To Cellar Sprinkler," where only these are installed, or "To Automatic Sprinkler," where entire building is equipped.

12. Just inside of the building, in a horizontal section, shall be placed a straightway check valve. A drip pipe, with valve to same, shall be placed between said check valve and Siamese connection to properly drain this section to prevent freezing.

13. Piping shall be wrought iron or steel, galvanized, and, together with fittings and connections, shall be of such strength as to safely withstand at least 150 pounds water pressure to the square inch for 2 hours when ready for service, without leaking at joints, valves or fittings; such test to be made by the Chief of the Fire Department.

14. All such sprinkler equipments shall be in accordance with the regulations of, and plans shall meet the approval of the Chief of the Fire Department.

Idem.

PART XXXV.

Construction and Equipment of Theatres.

461. *Buildings Covered.*—Every theatre or opera house or other building or parts of building designed or used for theatrical or operatic purposes, or motion picture shows, shall be built to comply with the requirements of this Code.

Idem.

462. *Capacity.*—The Supervisor shall determine the number of persons which every such building may accommodate. This determination shall be based on the actual number of seats and an allowance of 3 square feet per person for all parts of the auditorium or galleries where "standing room" may be provided. By standing room is meant such space in which by law persons may be permitted to stand during any performance. Such measurements are to be exclusive of required aisles, passageways and lobbies. No more than the number so determined and certified by the Supervisor shall be allowed in such structure at any one time.

Idem.

463. *Alterations.*—No building which at the time of the passage of this Code is not in actual use of the purposes indicated in Section 461 shall be altered or added to for the purpose of converting the same into a theatre, opera house, or for use by a motion picture show, unless when altered or added to, it conforms to the requirements of this Code.

Idem.

464. *Approvals Required.*—No building described in Section 461 shall be opened to the public until the Supervisor of Buildings, the Chief of Fire Department and the Electrical Inspector have jointly approved the same in writing in conformity with this Code.

Idem.

465. *Fireproof Building Over Auditorium.*—Nothing herein contained shall prevent the construction of a thoroughly fireproof building above a fireproof theatre, *provided* no part of such fireproof building shall be placed above that portion of any such building which is known as the stage section. The portion containing the theatre, including all passages, lobbies and other accessories connecting therewith, shall be cut off vertically from such fireproof building by unpierced fire walls of solid masonry not less than 12 inches thick, and horizontally by unpierced fireproof floors of strength to safely sustain a live load of 150 pounds per square foot on every superficial foot.

Idem.

466. *Roof Garden.*

1. A roof garden or open air auditorium (but no other place of public amusement) may be constructed above a fireproof building used for theatrical purposes built in conformity with the requirements of this Code. Such roof garden or open air auditorium shall have not less than 60 per cent. of its total floor area open to the sky without a roof, except that a cover of glass and metal skylight construction may be provided, and no part of its seating floor, or space upon which seats might be placed, shall be at greater height than 90 feet above the curb level at the main entrance to the building. The total capacity of such roof garden or open air auditorium shall not exceed 750 persons, figured on the same basis as that provided in Section 437. The construction of such roof garden or open air auditorium shall be fireproof and shall conform in every way to the requirements of this Code.

2. The size of entrances and exits, corridors and stairways shall be 50 per cent. greater than the corresponding requirements for theatres where the orchestra floor is at, or about the street level. If an audience is to be assembled in the theatre, at the same time as in the open air auditorium or roof garden constructed above the same, then the provisions for such entrance and exit herewith required for the latter shall be entirely distinct from and in addition to the provisions for exits and entrances, corridors and stairways required for the structure below.

3. If any structure is built over the ceiling or roof of any building used for a theatre, the girders, trusses or other metal members supporting said structure shall be protected against fire by at least 3 inches of fireproof material with special provision to reinforce or support it.

Idem.

467. *Occupancy Restricted.*

1. No portion of any building erected or altered, used or intended to be used for a theatre, shall be occupied or used for any business dealing in any inflammable, combustible or explosive article or material.

2. The before-mentioned restrictions relate not only to that portion of the building which contains the auditorium and the stage, but apply also to the entire structure in conjunction therewith.

Idem.

468. *Workshops and Property Storerooms.*

1. No workshop, storage or general property room shall be allowed in or under the auditorium, above the stage or under the same, or in any of the fly galleries; but such rooms or shops may be located in the rear of, or at the side of the stage, and in such cases they shall be separated from the stage vertically and horizontally by a brick or concrete wall not less than 12 inches in thickness or other equally efficient cut-off, and the openings leading into said portion shall have self-closing fire doors on one side of the wall and automatic fire doors on the other side of the wall.

2. No sleeping accommodations shall be allowed in any part of the building communicating with the auditorium or stage.

Idem.

469. *Separation of Vestibule from Auditorium.*—Interior fireproof walls or partitions shall separate the auditorium from the

entrance vestibule, and from any communicating room or rooms over or under the same, also from any lobbies, corridors, refreshment or other rooms forming part of the theatre; the openings in all such walls shall be protected by approved fire doors or fire windows. The doors shall be self-closing and the windows shall be stationary.

Idem.

470. *Floors.*—All floor surfaces shall be of concrete or other incombustible material, and no wooden boards or sleepers shall be used as a covering for floors, seat platforms, aisles, steps, landings, passages or stairs.

Idem.

471. No combustible doors or trim shall be used in the auditorium, and none of the walls or ceiling shall be covered with wooden sheathing, wainscoting, or other combustible material, but this shall not preclude the construction of a wooden sounding board over orchestra pit when the same extends back of and below the overhang of the stage, *provided* the said wooden sheathing be properly fire stopped by a 12-inch brick wall back of same, and also have a proper fireproof construction directly under the overhang of the stage extending from the brick wall to the apron of stage.

Idem.

472. *Seats.*

1. All seats in the auditorium (except those contained in boxes accommodating not more than 12 persons) shall be firmly secured to the floor, and shall be placed not less than 32 inches from back to back, measured horizontally. If benches without arms between seats are used, their capacity shall be figured on the basis of one person to each 18 inches in width.

2. No seat in any gallery shall have more than four seats intervening between it and an aisle, or more than ten seats in a row between any two aisles.

Idem.

473. *Gallery Platforms.*—No platforms in galleries formed to receive the seats shall be more than 21 inches in height of riser, nor less than 32 inches in width of platform. No such platform shall be nearer than 8 feet from the ceiling.

Idem.

474. *Tunnels or Cross Aisles.*—There shall be no more than 11 feet rise, measured vertically, in any aisle in any gallery without direct exit by tunnel or otherwise to a corridor or passage with a free opening to the gallery stairs or other direct discharge to the street. At such elevation of 11 feet or less, an intervening or cross aisle leading directly to an exit may be substituted for the tunnel. No such tunnel or cross aisle shall be less than 4 feet wide in the clear.

Idem.

475. *Aisles, Width of.*—Aisles shall be not less than 3 feet wide at the beginning, and all aisles shall be increased in width toward the exits 3 inches for every 10 feet of length.

Idem.

476. *Steps in Aisles.*—Steps in aisles of galleries only shall be the full width of the aisle. No risers shall be more than 7½ inches in height, and no tread shall be less than 10 inches in width, and whenever the rise of seat platforms is 4 inches or less, the floor of the aisles shall be made as a gradient. Where steps are placed in passages they shall be grouped together and shall be clearly lighted. No stool, seat or other obstruction shall be placed in any aisle, nor shall any person be allowed to stand in such aisles, or the aisles of any building or structure where people congregate.

Idem.

477. *Floors at Exits.*—In the auditorium there shall be no step within 4 feet of the front of an exit or entrance doorway, nor within one foot of the side thereof.

Idem.

478. *Passages.*

1. The width of passages and hallways shall be computed in the same manner as that hereinafter provided for stairways, but no passage may be less than 5 feet in width.

2. All passages, hallways, and stairways leading from any balcony or gallery in any direction shall permit of free passage to an exit without returning.

3. The aggregate capacity of the foyers, lobbies, hallways, passages, and rooms for the use of the audience, not including aisle space, shall on each tier be sufficient to contain the entire number to be accommodated on said tier, in the ratio of 150 superficial square feet of floor for every hundred persons.

Idem.

479. *Calculation of Exits.*

1. The combined width of entrances and exits for each tier, likewise their stairways, shall provide one foot of width for each 20 persons to be accommodated in that tier.

2. The width of entrance stairways shall be at least 50 per cent. of the combined width of the entrance and exit stairways, and the aggregate width of emergency exit doorways opening from each gallery shall be 60 per cent. more than the stairways to which they lead.

Idem.

480. *Entrances.*

1. A common place of entrance may serve for the orchestra floor of the auditorium and the first gallery, *provided* such entrance and the passages leading thereto are of the width required for the aggregate capacity of these two tiers.

2. Separate places of entrance shall be provided for each gallery above the first.

3. Where the number accommodated in a gallery exceeds two hundred, there shall be at least two separate and distinct entrances.

Idem.

481. *Entrances on Street Fronts.*

1. Every building used for the purposes designated in Section 461 shall have at least the front or one side wall bordering on a street, and not less than one-half of the openings required for entrance of the audience to the auditorium shall be provided in such wall or walls.

2. Where any entrance does not open directly on a street, corridor, or passage connecting with the street, it shall be constructed of continuous walls of brick or other fireproof material equally efficient. The roof construction of these corridors shall be fireproof and of strength sufficient to safely sustain a live load of 150 pounds per square foot of area. The height of such corridors shall be not less than 10 feet. No doors or windows shall be permitted in the side walls or roof.

Idem.

482. *Emergency Exits.*—From the auditorium at least two emergency exits remote from each other leading into open courts or streets shall be provided in each side wall of the auditorium on all tiers. Each exit shall be provided with approved fire doors.

Idem.

483. *Entrance and Exit Doorways.*

1. The minimum width of doorways shall be 5 feet in the clear, except emergency exit doorways, which may be 44 inches.

2. All entrances and exit doors shall open outward, and be hung in such manner as not to obstruct any part of the required width of a doorway, passage or stairway. The fastenings of these doors shall be of an automatic handle bar pattern, such as can readily be opened from the inside at all times without the use of keys or any special knowledge or effort. The use of draw bolts is prohibited. All such doorways shall be entirely unobstructed.

Idem.

484. *Marking Exits.*

1. Every entrance and exit doorway opening from the auditorium shall have the metal box with green letters over the same on the auditorium side, the word "Exit" inscribed in legible letters not less than 6 inches high, as hereinbefore stated.

2. No mirrors shall be so placed as to give the appearance of doorway, exit, or passage. There shall be no false doors or windows.

Idem.

485. *Diagrams of Exits.*—There shall be legibly printed on the program of each performance a separate diagram or plan of every tier. Each such diagram shall occupy a space not less than 15 square inches and shall show distinctly the entrances and exits from each tier and where they lead.

Idem.

486. *Stair Landings.*—When stairs turn at an angle or return directly on themselves, a landing, without steps, of the full width of both flights, shall be provided. The outer line of landings shall be curved to a radius of not less than 2 feet; this provision, however, shall not apply to emergency exit stairs on outside of buildings. When two side stairways connect with one main stairway, the width of the main stairway shall be at least equal to the aggregate width of the side stairways. No stairway shall ascend to a greater height than 10 feet without a level landing, and the length and width of such landing shall be not less than the width of the stairs; no run of stairs shall consist of less than six risers between platforms.

Idem.

487. *Stair Rails.*—All stairways shall have on both sides strong hand rails. Where stairways are built between walls, rails shall be

firmly secured to the walls about 3 inches distant therefrom. All rails shall be about 3 feet above the treads. This provision shall also apply to all steps in side aisles of galleries. The width of all stairs shall be measured between hand rails. All stairways and landings between stories, when 7 feet and over in width, shall be provided with a center hand rail of metal, not less than 2 inches in diameter, placed at a height of about 3 feet above the treads and landings. Such rails shall be supported on metal standards securely bolted to the treads or risers of the stairs. At the head of the stairway at each story, a newel post shall be provided at least 6 feet in height, to which the rail shall be secured.

Idem.

488. *Entrance Stairways.*

1. No entrance stairway to any tier in the auditorium shall be less than 5 feet wide.

2. Entrance stairways and passages for the dressing rooms shall be at least 36 inches wide and extend independently to the street or court. No stairs in the stage section shall be less than 30 inches wide.

3. No door shall open immediately upon a flight of stairs, but a landing at least the width of the door shall be provided between such stairs and such door.

Idem.

489. *Stairway Enclosures.*—All entrance stairways for the use of the audience (excepting those leading to the first gallery only, which may be open on one side) shall be enclosed with walls of brick or other fireproof materials in the stories through which they pass. There shall be no communication from any portion of the building above the street or court grade to any of said stairway enclosures except from the tier for which the stairway is exclusively intended. No stairway from a gallery shall communicate with the basement or cellar.

Idem.

490. *Emergency Exit Stairways and Balconies.*—Emergency exit stairways from each gallery shall be placed in smoke-proof towers, or an approved form of open air stairway may be used. The minimum width of emergency exit stairways shall be 4 feet, except that their width may be reduced 15 per cent. if located in a smoke-proof tower having no openings except to an outside balcony and to court grade. The stairways for the emergency exists from each tier shall

extend to the court or street grade independently of the stairways or exits from other tiers. Outside balconies shall be at least as wide as the stairways which they serve, but in no case less than 6 feet. No riser shall be nearer than one foot to the door opening.

Idem.

491. *Construction of Balconies and Stairways for Emergency Exits.*—All emergency exit balconies and stairways shall be constructed of steel or of other forms of incombustible construction approved by the Supervisor. Risers, treads, platforms and balconies must be solid, without slats, and the construction shall be of strength sufficient to sustain safely a live load of 100 pounds per square foot with a safety factor of 4. Exterior stairways and balconies of steel construction shall be designed in conformity with the requirements of paragraph 2, Section 301. Sheet metal or other suitable solid material shall be provided to a height of not less than 4 feet on the outer side of all such open air stairways, balconies and platforms, and they shall be covered with a metal, hood or awning constructed in a manner approved by the Supervisor. There shall be no openings in any theatre wall between the outside balconies or stairways and their covers, except the required exits from the tier served by said stairways and balconies. No person of the audience shall be obliged to pass alongside of more than one exit doorway after reaching an outside balcony to get to the ground. All exit stairways and balconies shall be kept free of obstructions of every kind, including snow and ice.

Idem.

492. *Treads and Risers.*—All stairs shall have treads of uniform width, and risers of uniform height in each flight. The risers shall not exceed 7 inches in height, nor shall the treads, exclusive of nosing, be less than 10 inches wide. No circular stairs shall be permitted, and no winders shall be introduced in any stairs which may be used for exit purposes.

Idem.

493. *Exits from Stage Section.*—At least two independent exterior exits with direct outlet at court or street grade shall be provided from the stage level for the service of the stage and floors below same. These exits shall be at opposite sides of the stage and may serve also as entrances. Each tier of dressing rooms shall have an independent emergency exit leading directly to an open air stairway,

or to a court or street. No ladder fire escapes shall be permitted. The fly galleries shall be provided with adequate means of exit. All exits from the stage section shall be independent of the exits for the audience above the court or street grade. Stairways, if any, leading down from stage level shall be enclosed and protected by fireproof doors.

Idem.

494. *Emergency Courts.*—There shall be reserved for emergency exit purposes an open court or space on the side or sides of the buildings as follows:

(a) In the case of a plot with streets on front, rear, and both sides, or in the case of a double corner plot where both sides of the theatre border on streets, no courts will be required. On a double corner, single corner, or inside plot when one side only of the building borders on a street, one court will be required located on the opposite side. On an inside plot where only the building front borders on the street, courts shall be provided on both sides.

(b) In buildings used for motion picture shows and having no stage, the exits and courts above required may be replaced by equivalent exits and courts at the rear if consistent with the adequate distribution of the entire entrance and exit facilities.

Idem.

495. *Court Width.*—The minimum width of open courts shall be 8 feet when the total capacity is 750 or less; 10 feet when the capacity is between 750 and 1,000; and when the capacity exceeds 1,000 people the width of the courts shall be increased one foot for each additional 500 people or fraction thereof in excess of 1,000.

Idem.

496. *Court Length.*—Said open court or courts shall extend at least from the line of the proscenium wall the length of the auditorium to the wall separating the same from the entrance lobby or vestibule. This entire court area shall be open to the sky, except that emergency exit stairways and smoke-proof towers may occupy part of the court space if the required width of exit passageways is not obstructed.

Idem.

497. *Court Corridors.*—Where said emergency courts do not open directly on a street, a separate and distinct corridor or passage

shall continue directly to the street, around the building or through such structure as may be or may have been built on the street, but no such passageway shall pass under any portion of the auditorium or stage. Said corridors or passages shall be constructed fireproof all the way to the street in same manner as provided for the construction of corridors for entrances in Section 377, paragraph 3. The corridor or passage leading from the court to the street shall be at least as wide as the court, and there shall be no projections into the passage. The outer openings may be provided with doors or gates opening outward. During the performance these doors or gates shall be kept open; at other times they may be closed and fastened by movable bolts.

Idem.

498. *Entrances in Courts.*—If entrances open on emergency courts or corridors the said courts or corridors shall be increased in width an amount at least equal to the width of the entrances which they serve.

Idem.

499. *Courts and Corridors Kept Clean.*—The courts and corridors or passages shall not be used for storage purposes, nor for any purpose whatsoever except for exit and entrance, and must be kept free and clear during performances.

Idem.

500. *Gradients.*—All courts and corridors at points of street entrance or exit shall be flush with sidewalk. To overcome any difference of level in and between courts, corridors, lobbies, passages and aisles on the ground floor, gradients shall be employed of not over one foot in 10 feet, except that runs of not more than 10 feet in length may be one in eight.

Idem.

501. *Proscenium Wall.*—A fire wall built of brick or concrete not less than 12 inches thick in any portion shall separate the auditorium from the stage and shall extend at least 4 feet above the stage roof, or the auditorium roof if the latter be higher. Any windows in the structure above the auditorium which face over roof of stage section when within 100 feet of the stage roof must be protected with fire shutters or fire windows. Above the proscenium opening there shall be a girder or other support of sufficient strength to safely carry

the load. If a girder be used it shall be protected against fire by at least 4 inches of fireproof material with special provision to reinforce or support it.

Idem.

502. *Proscenium Curtain.*

1. The proscenium opening shall be provided with a rigid fireproof curtain, built in conformity with the following specifications or their equivalent in efficiency when approved by the Supervisor.

2. The curtain shall have a rigid, rivet-jointed, steel framework. The front or audience side of the frame shall be covered with sheet steel of a thickness not less than No. 20 U. S. gauge. The back shall be covered with vitrified cellular asbestos boards at least 1 inch thick, or other material equally fire resisting. Both coverings shall be securely attached to the framework and the joint properly sealed. The curtain shall be designed to resist a wind pressure of 10 pounds per square foot of surface without flexure sufficient to interfere with its closing.

3. The thickness of the curtain shall be not less than 3 inches where the width of the proscenium wall opening is 30 feet or less; curtains for larger openings shall increase in thickness in proportion to the increase in width of opening they cover.

4. An asbestos roll of a diameter not less than one-half the thickness of the curtain shall be securely attached to the bottom of the curtain to form a smoke seal between the curtain and the stage floor.

5. The curtain shall overlap the proscenium wall opening at least 12 inches at each side of the opening and not less than 2 feet at the top.

6. The guide members at the sides shall be rolled steel shapes, none of which shall be less than ⅜-inch thick, and shall be of such character as to form a continuous smoke seal from top to bottom, with a clearance of not over ⅜-inch. The guides shall be installed in such manner that in case of fire on the stage the pressure of heated gases against the curtain will act to close the guide joints tightly. Provision shall be made to prevent the curtain from getting out of the guiding channel into which it shall project at least 2 inches. The proscenium wall shall have an off-set at each side of the opening, so located and of such thickness and height as to be suitable for the attachment of the curtain guides. At least 1 inch shall be allowed at each edge of curtain to provide for lateral expansion.

Opportunity for expansion of the unprotected structural framework of the curtain and guides shall be furnished by slotting the holes of the connecting bolts.

7. The wall over the proscenium opening shall be smooth and plumb to approximately the top of the curtain when it is down, and shall then offset at least 4 inches for the rest of its height, thus leaving a bench along the line of the top of the curtain between which a smoke seal shall be formed. Such a seal may conveniently be provided by arranging for the edge of a rolled steel shape attached to the curtain to dip into a trough of sand resting on the bench.

8. No part of a curtain or any of the curtain guides shall be supported by, or fastened to, any combustible material.

9. The hoisting apparatus for the curtain shall be designed with a factor of safety of 8.

10. The points for curtain suspension shall always be an even number, but never less than four. Two of the suspension points shall be located at the extreme ends of the curtain, and the others may be placed at such points as best suit the design, but in no case shall the distance between any two points of support exceed 10 feet.

11. Half of the cables attached to these points shall lead to one set of counterweights and half to another. The curtain shall be operated by hydraulic or other mechanism approved by the Supervisor. If hydraulic mechanism is used, the water may be taken from either the house tank or sprinkler tank supply. If from the latter, the supply pipe for curtain mechanism shall be so located in the tank that it cannot reduce the quantity of water below the amount necessary to fulfill the sprinkler requirements.

12. The device for controlling the curtain shall be simple in design, and capable of convenient operation from both sides of the stage and from the tie galleries.

13. The drop speed of the curtain shall be uniform and not less than 1 foot per second, but when the curtain is about 2½ feet from the stage it shall automatically slow down so as to settle on the stage without shock. In addition to the regular operating mechanism, there shall be an emergency device which will cut off the power and allow the curtain to drop by gravity. This device shall be so arranged that it can be easily operated by hand from each side of the stage, under the stage, and in the tie galleries. The device shall also be so designed that its operation will be controlled by fusible links located at each of the above named points.

14. The audience side of the curtain may be decorated with a paint in which no oil is used. No combustible material shall be applied or attached to the curtain.

15. Drawings for every such curtain shall be submitted to the Supervisor, and be approved by him before it is erected.

Idem.

503. *Counterweights.*—Where counterweights are used, they shall be suspended at the extreme side or other walls of the stage section, and be enclosed by guards.

Idem.

504. *Other Openings in Proscenium Wall.*—Openings between the stage and auditorium other than the proscenium opening shall not exceed four in number; two at the approximate stage level and two in the musicians' pit; the size of any such opening shall not exceed 21 square feet. The openings at stage level shall have an automatic fire door on one side of the wall and self-closing fire door on the other side of the wall; openings, if any, below the stage shall have a self-closing fire door; all of said doors shall be hung so as to be opened from either side of the wall at all times.

Idem.

505. *Overhang of Stage.*—All that portion of the stage extending from the stage inside of the curtain and from the wall separating the space under the stage from the auditorium, to the outer edge of the apron shall be fireproof. A wood finish floor without air space may be used on the stage in front of the curtain.

Idem.

506. *Opening in Exterior Walls.*—All openings in exterior walls of stage section shall be protected by approved fire doors, shutter, or windows.

Idem.

507. *Vestibules for Stage Entrances.*—All entrances to the stage from streets, alleys, or open courts shall be vestibuled to protect the stage from drafts of air.

Idem.

508. *Fireproof Stage Construction.*—All that portion of the stage which is not movable (excepting that part usually embraced between the proscenium jambs and from proscenium to rear wall) shall be of fireproof construction and designed to safely sustain a

live load of not less than 100 pounds per square foot. The non-fireproof portion of stage floor shall be of heavy timbers or steel beam construction with flooring not less than 1¾-inch finish thickness.

Idem.

509. *Fly and Tie Galleries.*—The fly galleries and the tie galleries shall be of fireproof construction designed to safely sustain a live load of 90 pounds per square foot. No wooden boards or sleepers shall be used as a covering over these floors.

Idem.

510. *Gridiron.*—The gridiron or rigging loft shall have a lattice metal floor capable of sustaining a live load of 75 pounds per square foot and be readily accessible by metal stairs or ladder.

Idem.

511. *Scenery.*—All stage scenery, curtains, and decorations made of combustile material, and all woodwork on or about the stage, shall be painted or saturated with some non-combustible material, or otherwise rendered safe against fire.

Idem.

512. *Ventilation in Stage Section.*

1. There shall be one or more ventilators, constructed of metal or other incombustible material, near the center and above the highest part of the stage of every theatre, raised above the stage roof, and of a combined sectional area equal to at least 10 per cent. of the floor area within the stage walls. The openings in such ventilators shall have an aggregate sectional area at least equal to that required for the ventilators. Detailed drawings showing the construction and operation of the ventilators must be approved by the Supervisor before installation is begun. The entire equipment shall conform to the following requirements or their equivalent.

2. The construction of the cover and its operating mechanism shall be massive, and the cover shall open by force of gravity sufficient to effectively overcome the effects of neglect, rust, dirt, frost, snow, or expansion by heat, or warping of the framework.

3. Glass, if used in ventilators, must be protected against falling on the stage. A wire screen if used under the glass must be so placed that if clogged it cannot reduce the required vent area or interfere with the operating mechanism, or obstruct the distribution of water from the automatic sprinklers.

4. The cover shall be arranged to open instantly after the outbreak of fire by the use of approved automatic fusible links of the thinnest metal practicable; manual control also must be provided by a cord run down to the stage at a point designated by the Supervisor.

5. The link and cord must hold the cover closed against a force of at least 30 pounds excess counterweight tending to open the cover. Fusible links shall be placed in the ventilator above the roof line and in at least two other points in each controlling cord. No automatic sprinkler heads shall be placed in the ventilator space above the fusible links. While theatre is in use each ventilator cover shall be operated daily by one of the cords.

Idem.

513. *Skylights.*—If any skylight is placed in a roof, it shall be installed in accordance with the requirements of Section 349.

Idem.

514. *Dressing Rooms.*

1. Actors dressing rooms shall not be placed on or under the stage, or in or under the auditorium. They shall be in a separate section provided for that purpose. No dressing room ceiling shall be less than 4 feet, 6 inches above the level of street or court adjoining.

2. The walls separating the section containing the dressing rooms from the stage or auditorium, shall be of brick or concrete not less than 8 inches in thickness and each opening therein shall be protected with a self-closing fire door. The partitions dividing the dressing rooms, together with the partitions of every passageway from the same to the stage shall be constructed of approved fireproof material not less than 4 inches in thickness. All doorways in any of said partitions shall be protected by self-closing fire doors. All dressing rooms shall be ventilated by fire windows to a street or to a court not less than 24 square feet in area.

3. All shelving and cupboards in every dressing room, property room or other storage rooms, shall be of incombustible material.

Idem.

515. *Apparatus.*

1. Steam boilers may be located outside of the buildings either under the sidewalk or in an extension, or within any portion of the building, *provided* that same are placed in a fireproof room one side of which opens on an open court or public thoroughfare, the space

allotted to the same shall be enclosed by walls of brick or concrete at least 12 inches thick on all sides, and the ceiling of such space shall be constructed of fireproof materials. Each doorway in said walls connecting with the building shall have an automatic fire door.

2. No floor register for heating, ventilating or other purposes shall be permitted in aisles, corridors or passageways.

3. All blowers used to circulate air through heating or ventilating pipes with openings to the auditorium shall be provided with a device to stop the blower automatically in case of fire. The device for this purpose shall be located near the blower, both inside and outside the pipe leading to openings in the auditorium.

4. No coil, radiator or pipe shall be placed so as to obstruct any aisle or passageway. Any exposed radiator or coil shall be guarded.

Idem.

516. *Lighting.*

1. The stage section and every portion of the building devoted to the uses or accommodation of the public, also all passages leading to streets, including the open courts and corridors, shall be satisfactorily lighted during every performance, and until the entire audience has left the premises.

2. Only electric light shall be used in the auditorium and stage section, except that gas fixtures having not larger than "1 foot" burners may be used in dressing rooms. These shall have soldered to the fixtures strong wire guards or screens not less than 10 inches in diameter, so constructed that any material in contact therewith shall be out of reach of the flames.

3. Where electric current from two separate street mains are available, two separate and distinct services must be installed; one service to be of sufficient capacity to supply current for the entire equipment of the theatre, while the other service must be at least sufficient to supply current for all emergency lights, including the exit lights or signs, and all lights in outside courts, lobbies, stairways, corridors, and other portions of the theatre which are normally kept lighted during the performance. Where only one supply from a street main is available the connection used exclusively for emergency lights must be taken from a point on the street side of the main service fuses. When the source of supply is an isolated plant on the same premises, an auxiliary service at least sufficient to supply all emergency lights shall be connected with some outside source, or a

suitable storage battery within the premises may be considered the equivalent of such service. Where two sources of electric light are not available, an emergency system of gas lighting shall be installed and kept in working order.

4. At least one lawful EXIT light shall be placed over each exit and entrance opening from the auditorium and stage section.

5. All emergency lights shall be controlled by a special switch located in the lobby and accessible only to authorized persons.

6. The stage switchboard shall have a metal hood over the top, running the full length of the board and fully protecting same from anything falling from above.

Idem.

517. *Automatic Sprinkler Equipment.*

1. A standard wet-pipe system of approved automatic sprinklers shall be installed throughout the theatre, except in the auditorium, foyers and lobbies. Sprinklers shall not be permitted over dynamos and switchboards or above the fusible links immediately under the automatic ventilators over stage.

2. Sprinkler equipments shall be installed in accordance with the requirements of Section 460.

Idem.

518. *Standpipes.*

1. Standpipes conforming to the requirements in Section 459 shall be provided with hose connections located as follows: One on each side of the stage on each tier, one readily accessible from the property room, the carpenter shop, scenery storage rooms, lobbies and elsewhere as may be required by the Supervisor.

2. A sufficient quantity of approved linen hose, 1½ inches in diameter, in 50-foot lengths or enough to cover floor area, shall be kept attached to each hose connection; 25-foot lengths will be permitted in fly galleries.

Idem.

519. *Miscellaneous Fire Appliances.*

1. There shall be on each side of the stage two axes, one 20-foot, one 15-foot, and one 10-foot hook, as designated by the Fire Department On each side of the stage, under the stage, on each fly gallery, also in property and other store rooms, and in each workshop, there shall be kept in readiness for immediate use one approved 2½ gallon

hand chemical fire extinguisher and one 40-gallon cask filled with water, and six fire pails; said casks and buckets shall be painted red and lettered "For Fire Purposes Only." There shall also be provided at least three approved 2½-gallon hand chemical fire extinguishers for each tier of the auditorium.

2. All apparatus for the extinguishment of fire shall be installed in accordance with the rules of the Fire Department and be kept at all times in condition satisfactory to and under control of the Fire Department.

Idem.

PART XXXVI.

Construction of Moving Picture Theatres.

520. *Requirements for Exhibition Room.*

1. No motion picture machine shall be installed, maintained or operated in any building that does not abut directly upon a street; nor shall any such machine be installed, maintained or operated in connection with any exhibition room contained in a building occupied as a hotel, tenement house, or lodging house; nor in factories or workshops, except where the exhibition room and motion picture machine are separated from the rest of the building by unpierced fireproof walls and floors; in no case shall the main floor of such exhibition room be more than 4 feet above or below the adjoining grade level. All such floors, including gallery floors to be preferably of reinforced concrete or other approved fireproof construction, or may be of mill construction as herein provided, and have 2-ply of 14 lb. asbestos paper between the floors, and be fireproofed on under side with metal lath or ¼-inch plaster board and not less than ⅜ inch of cement plaster.

To overcome any difference of level on the ground floor gradients shall be employed of not over one foot in 10 feet; no steps shall be permitted. Exit doors shall be at the same level as the sidewalk.

2. If the walls of the auditorium contain wooden studs, they shall be protected with metal lath and not less than ⅝ inch of cement or cement-tempered plaster, or be covered with ¼-inch plaster boards and plastered with ¼ inch of plaster, or covered with metal. The

joints shall be properly filled with mortar. The ceilings of all such auditoriums having wooden construction, and the ceilings of any basement or cellar which may exist under such auditoriums, shall be protected with metal lath and cement plaster or with ¼-inch plaster board and covered with plaster or metal as above specified for protection of walls. All metal lath used in such construction shall be of quality specified in Section 377.

3. All motion picture exhibition rooms shall be provided with at least four separate exits, two of which shall be in the front and the other two in the rear or side near the rear, all leading to alley, or open court or passageway. No exits shall be less than 5 feet in width, and there shall be a main exit not less than 10 feet in total width.

4. If an unobstructed exit to a street or alley or unobstructed open court cannot be provided at the rear of such buildings as herein specified, either an open court or a fireproof passage or corridor shall be provided from rear exit to the street front, of at least 4 feet in width for exhibition rooms accommodating fifty persons or less, and 6 inches additional for each additional fifty persons acommodated by such room. Such passage shall be constructed of fireproof material and shall be at least 10 feet high in the clear. The walls forming such passage shall be at least 8 inches thick, of brick or other approved fireproof material, and if there be a basement the wall on the auditorium side shall either run 1 foot below the cellar bottom or may be carried in the cellar on iron columns and girders properly fireproofed. The ceiling of said passages, and, if there be a basement, the floor, shall be of fireproof construction.

5. If unobstructed rear exits or exits to a street are provided, the said exit or exits shall be of the same total width required for the court or passage above mentioned. Said passages and exits to the street shall be used for no other purposes except for exit and entrance, and shall be kept free and clear.

6. The level of the open court or passage where it intersects the street shall be not greater than one step above the level of the sidewalk, and the grade shall be not more than 1 foot in 10, with no perpendicular rises.

7. All seats in any exhibition room for moving picture theatre shall be not less than 32 inches from back to back, measured horizontally, and securely fastened to the floor; they shall be so arranged that there will be not more than ten seats in a line betwen aisles, nor more than four between any seat and an aisle. All aisles shall lead

directly to exits and all exits shall be directly acessible to aisles. No aisle shall be less than 3 feet, 6 inches in width. All exit doors shall be arranged to swing outward and be provided with fastenings that can be opened readily from the inside, without the use of keys or any special effort. Such doors shall not be locked when the room is open to the public.

8. All the requirements of this section relating to seats, aisles, passageways, exits and doors shall apply in connection with each open-air motion picture exhibition.

9. Every exit doorway leading from exhibition room shall have over the same on the auditorium side, the word "EXIT" in letters in metal box as herein provided not less than 6 inches high. Light used in marking exits or lighting passageways, stairways or inclines leading from them shall not depend upon or be controlled by wires, switches or fuses located in room, compartment, booth or enclosure containing motion picture machines, but shall be controlled from both the operating room and ticket office.

Idem.

521. *Approval of Picture Machine Theatres.*—No picture machine theatre shall be opened to the public until a joint certificate of approval, has been issued by the Supervisor of Buildings and the Electrical Inspector, and in no case shall any certificate of approval be issued until the entire building, structure, works, and appliances, conform to all the conditions of this ordinance.

Idem.

522. *Board of Examiners of Operators of Moving Picture Machines.*—The Commissioner of Fire, Sprinkling and Building Inspection, the Supervisor of Buildings, and the Electrical Inspector are hereby constituted as a Board to examine and pass on all applications to operate moving picture machines in the City of Nashville, Tennessee.

Idem.

523. *Operators of Picture Machines.*—Every moving picture machine shall be operated by a competent male person, not less than 18 years of age, and then not until he has answered all questions and requirements contained in the form (furnished by the Board of Examiners), which shall be countersigned and vouched for by the owner, lessee or employer who shall also be held responsible for the conduct

and efficiency of such persons while in charge of and operating the said owner's, lessee's or employer's moving picture machine.

Provided, that an apprentice learning the business may work under the direction and in the presence of the regular operator only for the purpose of perfecting his vocation.

Idem.

PART XXXVII.

Assembly Halls.

524. *Requirements for Public Safety.*

1. In all buildings or parts of buildings occupied for purposes of assembly, other than theatres, which are provided for in Sections 460 to 519, inclusive, the halls, doors, stairways, passageways, and all other exit facilities shall conform to the provisions of this Code as provided for in Sections 300-309.

3. All seats shall be spaced as required for theatres. In computing the seating capacity of any room or building used for purposes of assembly in which the seats are not fixed, an allowance of six square feet of floor area shall be made for each person and all space between the walls or partitions of such room or building shall be measured in this computation. Movable seats are not permitted in balconies and galleries having stepped floors.

3. Any assembly hall containing a stage, shall comply with the requirements for theatres, except that stages the area of which do not exceed one-fifth the area of the auditorium and having no transient scenery other than especially approved by the Supervisor, may conform to the following requirements: The proscenium wall may be built as required for fireproof partitions, Section 379. All allowed openings in the proscenium wall except the curtain opening shall be protected by approved fire doors. The curtain in such assembly halls may be of asbestos instead of the rigid theatre curtain and shall be hung on incombustible supports. All scenery, borders, and wings shall be rendered non-inflammable as provided in Section 511.

Idem.

PART XXXVIII.

Garages.

525. *Garages.*

1. Private garages may be erected on the rear of premises similar to other outhouses within any zone except the Fire Retarding Zone.

2. Such garages shall not be more than one story in height and no larger than necessary to acommodate three such vehicles using gasolene or other volatile inflammable liquid for power.

3. Such buildings shall in all cases have approved fireproof floors, and the walls and the roofs thereof shall be of same materials as herein provided for buildings within such Zones.

4. Provided, that private garages may have a second story for servant's quarters if the floors and ceilings are made of such fire retarding construction as double thick floors on top of joist with two ply of 14 lb. asbestos paper between, and metal lath and cement plaster on the ceiling.

5. And further provided that such one story garages may be of such all-metal buildings as are approved by the Supervisor of Buildings.

Idem.

526. *Public Garages.*—No public garage shall be permitted where any portion of the building is occupied for amusement, assemblage or habitational purposes.

Idem.

527. That all buildings used for public garages, occupied or erected after the passage of this ordinance, shall be of approved fireproof construction, provided that roof for same may be of mill construction.

Idem.

528. 1. All public garages, or rooms, or sections thereof containing automobiles, shall be entirely separated by fire and vapor proof partitions from any and all portions of such buildings used for machine or repair purposes, or for any purpose requiring the use of flame heat boilers and (or) furnaces.

2. All such wall must be without openings to the interior of the garage, except in such cases as when, in the judgment of the Supervisor of Buildings, the existence of such openings will not increase

the hazard to life and property, *provided* further such openings, when permitted must be protected by approved automatic fire doors, such door or doors to be kept tightly closed at all times when the opening is not actually being used.

3. All doors and windows in public garages, within 30 feet or closer to other buildings, shall be protected with approved fireproof doors, shutters, or fireproof windows of metal and wired glass.

4. There must be a system of ventilation to the outer air, with openings at floor line, not less than 6x8 inches for each ventilator.

Idem.

529. That heating must be done by steam or hot water. The boiler room and any room where electric charging apparatus is used must be fireproof, and all openings between such rooms and other parts of the garage, shall be protected by automatic fire doors, these doors to be kept constantly closed, except when open for actual passageway.

1. No stove, forges, torches, or furnaces, and no open flame or heat devices, shall be used or permitted in any room containing automobiles or gasoline, except such automobiles as are being actually rerepaired and in the repair room or shop.

2. Only incandescent electric light, preferably enclosed in vaporproof globes, with keyless sockets, protected by approved wire guards, and with all switches and fuses in approved cabinets shall be permitted.

3. All fire and lights on vehicles except electric lights or automobiles, shall be extinguished upon the entry of such vehicles or automobiles, into the garage as soon as the vehicle, or automobile comes to a standstill, and before the door of entry is closed, and shall not be lighted while the same is in the garage until the vehicle, or automobile is brought within 10 feet of the exit.

4. No person shall smoke in any garage. A notice in large letters "No Smoking" shall be kept displayed in a conspicuous place and manner on each floor and at the entrance of all garages.

Idem.

530. That on the floor of every garage, there shall be constantly kept and maintained, convenient receptacles filled with sand, to be used in absorbing waste oils on the floors. In addition thereto, sand shall be kept on every floor in boxes or buckets of approved construction, provided with metal hand scoops, to be used for fire extinguish-

ing purposes only. One such bucket, or box, to be provided for each 1,000 square feet of floor area.

1. One three-gallon carbonic acid gas fire extinguisher of approved construction, and one one-quart pump type extinguisher of approved make, shall be provided and conveniently located for each 2,000 square feet of floor area.

2. Self-closing metal waste cans, set firmly upon four-inch legs, shall be kept on all floors of every garage, and all inflammable waste materials must be deposited into these receptacles.

3. Calcium carbide shall be kept in air tight receptacles, these receptacles to be deposited in a close and secure canister, or container, which must be at least six inches above the floor. Said container to be of metal, and to have a secure metal closing top, which must be kept closed at all times when the container is not in use.

Idem.

PART XXXIX.

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531. *Storage and Handling of Volatile Substances.*—The handling or storing of any inflammable liquid within dangerous proximity to an open flame or fire is expressly prohibited. Where inflammable liquids are kept, used or handled, one quart chemical extinguishers bearing the label of the Underwriters Laboratories, Inc., shall be provided in such quantities as may be necessary, and no vessels or pumps or other fixtures or appliance shall be used unless it has the above label.

Idem.

532. *Approved Containers.*

1. No person, firm or corporation shall keep, nor permit to be kept on their premises for sale, use, manufacture or other purposes within the corporate limits of the City of Nashville, gasoline, naptha or other volatile inflammable fluids unless same is kept in approved storage receptacles.

2. Where any person, firm or corporation desires to keep five gallons or less of any volatile inflammable fluid or fluids for consumption, use or sale, an approved safety can or cans shall be provided.

3. No person, firm or corporation shall sell or deliver to any person, firm or corporation, five gallons or less of any volatile inflammable fluid unless delivered into such approved can or cans, and no person, firm or corporation shall be permitted to keep for consumption, use, sale or other purpose, more than five gallons in such cans in any house, and for the storage of greater quantities of any volatile inflammable fluid or fluids for consumption, use or sale, an approved underground storage system shall be provided.

Idem.

533. All underground storage tanks (with the exception of existing underground tanks now in use, and in good condition) should preferably be five feet or more from any building, and top of tank shall be at least three feet below the surface of the ground and below the level of the lowest pipe in the building to be supplied. If necessary, tanks may be permitted underneath the building if set on a firm foundation, encased in six inches of cement concrete, and buried at least three feet below the lowest floor.

Idem.

534. Tanks located outside of buildings shall be set on a firm foundation surrounded by soft earth or sand, well tamped into place or encased in six inches of Portland Cement Concrete. Tank may have a test well, *provided* such well extends nearly to the bottom of tank and top end shall be hermetically sealed and locked except when necessarily open.

Idem.

535. All hose pipe used for transferring gasoline to the storage tanks on vehicles shall be an approved metal-lined rubber hose.

Idem.

536. When tank is located underneath a building, the test well shall extend at least twelve feet above source of supply. The limit of storage permitted shall depend upon the location of tanks with respect of the building to be supplied and adjacent buildings, as follows:

(a) For an unlimited capacity—if the top of tank is lower than any floor, basement, cellar or pit in any building within a radius of fifty feet.

(b) For 20,000 gallons total capacity, if the top of tank is lower than any floor, basement, cellar or pit in any building within a radius of thirty feet.

(c) For 5,000 gallons total capacity, if the top of tank is lower than any floor, basement, cellar or pit in any building within a radius of twenty feet.

(d) For 1,500 gallons total capacity, if the top of tank is lower than any floor, basement, cellar or pit in any building within a radius of thirty feet.

(e) For 500 gallons if not lower than any floor, basement, cellar or pit in any building within ten feet, in which case it must be entirely encased in six inches of concrete in addition to being three feet underground as provided above.

Idem.

537. 1. All underground storage systems in which the tank may contain inflammable gases shall have at least a one-inch vent pipe, run from top of tank to a point outside of the building, but which shall end at least twelve feet above level of source of supply and in a location remote from fire escapes and never nearer than three feet, measured horizontally and vertically, from any window or other opening; the tank vent pipe shall terminate in a goose-neck protected in the outer end by a 30x30 mesh or equivalent brass wire screen. Or a combined vent and filing pipes so equipped and located as to vent the tank at all times, even during filling operations.

2. The end of the filling pipe for underground storage tanks shall be carried to an approved location outside of any building, but not within five feet of any entrance door, or cellar opening, and shall be set in an approved metal box with cover which shall be kept locked except during filling operations, this filling pipe shall be closed by a screw cap.

3. A 30x30 mesh or equivalent brass screen strainer shall be placed in the supply end of filling pipe.

Idem.

538. Inflammable liquids shall be drawn from tanks by approved labeled pumps with controlling apparatus and piping so arranged as to allow control of the amount of discharge and prevent leakage and discharge inside the building by any derangement of the system. Pumps to be placed outside of and at least five feet from any building.

Idem.

539. Where the underground tanks are used, all pipes carrying volatile inflammable liquids except in dry cleaning establishments shall pitch toward tanks and shall enter tank at top. There shall be a check valve or other approved contrivance on all main line pipes leading from such underground storage tank and so located as to keep the pipe filled with gasolene at all times. All pipes passing through basement passageways, storerooms, or other places where they are liable to mechanical injury shall be enclosed in another pipe or substantial construction.

Idem.

540. Nothing in this ordinance shall be construed to prohibit a manufacturer from bringing into the factory in approved cans sufficient material for his daily operative needs.

Idem.

541. The carrying or transferring of any volatile inflammable fluids in open receptacles in or about any premises or the filling of tanks in automobiles or other vehicles or open receptacles from any delivery wagon or other transporting vehicle or the use of gasolene torches for lighting purposes in any building is expressly prohibited.

Idem.

542. Sponging is prohibited in shops, dwellings, enclosures, yards and other places, unless carried on through the application of such inflammable liquids from an approved automatically closing safety can of not more than one quart capacity. Not more than one quart of such inflammable liquids shall be used for any one such sponging operation.

2. Sponging is also prohibited in any room not provided with safe means of exit direct to the outside of the building and shall not be executed or applied in any room or enclosure containing any open or flaming fire or light, nor within ten feet of such light, self-heating iron, or other spark or flame-producing appliance. During all such application, and for one-half hour thereafter, two direct openings for ventilation and air circulation must be provided, preferably on opposite sides of the room and near the floor level.

Idem.

PART XL.

Buildings for Dry Cleaning.

543. All gasolene, or other volatile inflammable substances handled for cleaning, in quantities in excess of one gallon, shall be used or handled in a separate, well-ventilated fireproof building, which shall be constructed of non-combustible material as herein provided and shall not be more than one story or sixteen feet high, without a basement or other open space below the floor, and shall not be used for other occupancy, the walls, if of brick, shall not be less than thirteen inches thick, or if of reinforced concrete shall not be less than eight inches thick. All the floors and roofs shall be of concrete or other non-combustitble material.

Board of Commissioners, Ord. 832. Approved Oct. 24, 1916. *Idem.*

544. 1. In wash-rooms, only the necessary approved machinery and appliances for washing, extracting and redistilling shall be permitted, and not more than four machines of any character shall be permitted in any one room.

2. No direct opening shall be permitted between washrooms and dry rooms, and sufficient fireproof hallways shall be maintained to serve all such rooms. There shall be no exterior openings placed in the outside walls of a room when nearer than thirty feet of another building, but such necessary 8x10-inch intake vent openings shall be installed at the floor line, extending not less than six feet apart around the walls of the entire rooms and connected with 4x10-inch service pipes, all properly housed in the walls, which shall extend to at least two feet above the roof line and be capped over with proper hoods. But where the building is more than thirty feet from another building the inlet vent opening belongs to an outside wall may pierce through such outside wall to the exterior surface thereof.

3. Each room shall have an outlet exhaust, or vent opening, which shall conduct to and through a sufficient sparkless exhaust fan, which shall run continuously and empty into a vent stack which shall extend to an approved height and be of ample capacity to change the entire volume of air in each room or hall every five minutes.

4. All door openings shall be provided with approved fireproof gravity shutters or doors, which shall be kept closed except when passing through, and each door opening shall have a carpet strip rise

of one inch in the concrete floor under each door, all windows must have wire glass in metal frames. All doors, shutters windows and other necessary openings shall be arranged for ready opening or closing from either side in case of emergency, using a fusible link attachment for closing automatically.

5. No combustible material for racks or appurtenances shall be permitted in the construction of any wash or dry room, and all steam or hot water pipes for drying purposes must be protected by wire screens, or otherwise, so as to prevent contact between pipes and inflammable goods.

6. All rooms shall have an approved steam fire extinguishing system, erected similar to a standard water sprinkling system, with all necessary appliances for quick action. No outlet shall be more than eight feet from another outlet, a quick opening steam throttle valve shall be provided for each room and such valves shall be placed on a special valve board in groups, and the room number placed on the room and on the valve therefor, (or where such fire extinguishing system is not available, an approved system using a fire deterrent chemical or gas may be used), and in all cases an additional one quart approved hand chemical extinguisher shall be provided for each room, or for each 250 square feet of floor area.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

545. 1. Each room and hall must have approved sky lights with wire glass in metal frames and provided with fusible link attachments for closing of all vent transoms or openings automatically. Such vent transoms or openings shall be covered with 12x12 mesh brass wire screens to prevent sparks or other fire entrance.

2. Necessary precaution shall be taken to prevent clogging or stopping in any way of air passage through such wire screens or ventilators.

Idem.

546. 1. Heating shall be done by steam or hot water only and no steam boiler, furnace, exposed fire, electric dynamo or motor, or other spark devices shall be allowed in any washing, drying, or distilling room, or hall way opening thereto, or on the line with vapor travel therefrom.

2. All artificial lighting shall be in accordance with the rules and regulations of the "National Electric Code.'

Idem.

547. All existing dry cleaning plants shall comply with these ordinances within six months after official notice is received from the Supervisor of Buildings.

Idem.

548. *Machines for Dry Cleaning.*

1. All dry cleaning, washing, extracting and re-distilling shall be carried on in approved closed machines, which shall be fluid tight.

2. Washers may have hinged doors and shall be arranged so that in case of an explosion the door will automatically close.

3. The transfer of all liquids shall be through continuous piping, and all outlets or drain lines shall be drained by gravity to settling or storage tanks.

4. No dry cleaning liquids shall be settled in any open or unprotected vessels or tanks. All piping and all metallic parts of each machine shall be properly grounded by at least No. 10 copper insulated wire to a water pipe or other grounded devices.

5. All reserve and storage stocks of such liquids shall be kept and handled in accordance with the rules and regulations for the storage of gasoline.

6. *General Precautions.*—All goods removed from washers to extractors must be kept in tight metallic cans with under side of bottom covered with wood, and all footwear, barrels, kegs or other accessories used in dry cleaning establishments shall be free from iron and steel as a precautionary measure to obviate sparks, and no goods or washed stocks shall be taken from wash room until washing liquid has been removed by the extractor and all dried goods shall be removed from extractors at close of operation.

Idem.

549. *Settling Tanks.*

1. Settling tanks shall be constructed, located and vented essentially as given for the storage tanks. At the close of the day's operations, all liquid contained in washers, extractors or stills, or otherwise, shall be returned to the stock or settling tanks.

2. All tanks containing inflammable, volatile fluids shall be plainly marked by signs, indicating danger. All dry cleaning properties are to be enclosed entirely in substantial fences in a manner to prevent trespassing.

Idem.

550. *Tanks Above Ground for Wholesalers, Etc.*

1. That wholesalers, manufacturers and refiners may erect, within the third zone, above ground, tanks under the following conditions:

2. That each tank located above ground containing naptha, benzine, gasoline or other inflammable-volatile liquids of equal or higher inflammability, with a capacity of 24,000 gallons or over, shall be located not less than 50 feet from the nearest adjoining property line.

3. That each tank located above ground containing naptha, benzine, gasoline, or other inflammable-volatile liquids, or liquids of equal or higher inflammability, with a capacity less than 24,000 gallons and not more than 18,000 gallons, shall be located not less than 30 feet from the nearest adjoining property line.

4. That each tank located above ground containing naptha, benzine, gasoline or other inflammable-volatile liquids, or liquids of equal or a higher inflammability, with a capacity less than 18,000 gallons and not more than 12,000 gallons, shall be located not less than 25 feet from the nearest adjoining property line.

5. That each tank located above ground containing naptha, benzine, gasoline, or other inflammable-volatile liquids or liquids of equal or a higher inflammability, with a capacity less than 12,000 gallons and not more than 8,000 gallons, shall be located not less than 20 feet from the nearest adjoining property line.

6. That each above ground tank containing liquids having a flash test exceeding 74 degrees F. may have capacities twice that above specified, and may be located one-half the distance of the tanks of corresponding capacities, above designated;

7. *Provided,* that said distances herein provided do not apply to the street property line or the railroad line.

8. That reinforced concrete may be used in the construction of tanks to be used for inflammable-volatile liquids, *provided* they are constructed in conformity with the provisions of the Building Code of the City of Nashville.

9. Tanks, other than reinforced concrete tanks, must be constructed of galvanized steel, basic open hearth steel, or wrought iron of a minimum gauge (U. S. Standard), depending upon the capacity as given herein.

(1) Horizontal or vertical tanks not over 1,100 gallons capacity.

Capacity (Gallons)	*Minimum Thickness of Material.*
1 to 30	18 gauge
3 to 350	16 gauge
351 to 1,100	14 gauge

(2) Horizontal tanks over 1,100 gallons capacity.

Maximum Diameter.	*Minimum Thickness of Material.* *Shell.*	*Heads.*
Not over 5 feet	10 gauge	7 gauge
5 feet to 8 feet	7 gauge	¼ inch
8 feet to 11 feet	¼ inch	⅜ inch

(3) Vertical tanks over 1,100 gallons capacity.

Under 40 feet in diameter and containing not more than 5,000 gallons:

Bottom, No. 8 gauge.
Bottom Ring, No. 8 gauge.
Other Rings, No. 10 gauge.
Top, No. 12 gauge.

Under 40 feet in diameter and containing more than 5,000 gallons but less than 10,000 gallons:

Bottom, No. 8 gauge.
Bottom Ring, No. 7 gauge.
Other Rings, No. 8 gauge.
Top, No. 12 gauge.

Other vertical tanks to be of thickness not less than indicated in the following table, the figures referring to U. S. Standard gauge:

Diameter Feet.	*Top*	*Top Ring*	*2nd Ring from Top*	*3rd Ring from Top*	*4th Ring from Top*	*5th Ring from Top*	*6th Ring from Top*	*Bottom*
80	10	7	7	3	0	3-0	5-0	10
75	10	7	7	4	1	2-0	4-0	10
70	10	7	7	4	1	2-0	4-0	10
65	10	7	7	5	1	0	3-0	10
60	10	7	7	5	2	0	2-0	10
55	10	7	7	6	3	1	2-0	10
50	10	7	7	7	4	1	0	10
45	10	7	7	7	5	3	1	10
40 and less	10	7	7	7	5	3	2	10

All riveted joints to have an efficiency of at least 60 per cent.

Tanks of greater capacity than given above shall be of material of sufficient thickness to safely hold the contents, and proportionately heavier. No vertical tanks shall be more than 30 feet high.

Each above-ground tank, over 1,000 gallons in capacity, must have all manholes, hand holes, vent openings, and other openings which may emit inflammable vapor, provided with 30x30 mesh, brass wire screen, or its equivalent, so attached as to completely cover the opening and be protected against clogging. A safety valve or vent must be provided, or, if there is no safety valve or vent, then all manhole covers must be kept closed by weight only, and not firmly attached. The screen on such opening may be made removable, but must be kept normally firmly attached.

Tanks containing inflammable liquids flashing below 74 degrees Fr. (23 degrees Cent.) closed cup tester shall have painted conspicuously upon their side, in letters at least 2 inches high, the wording, "INFLAMMABLE—KEEP FIRE AWAY."

All tanks must be protected against corrosion by coating the outside with a suitable rust-resisting paint.

10. Tanks must be set upon a firm foundation, and must be electrically grounded.

Tanks more than one foot above the ground must have foundation and supports of non-combustible materials, except wooden cushions.

11. Piping to be run as directly as possible and proper allowance made for expansion and contraction.

12. Each pipe attached to tank to be provided with a valve with no branches nor outlets between the tank and valve.

13. The handling of all liquids having a flash point below 187 degrees Fr. (86 degrees Cent.) closed cup tester shall be preferable by approved pumps through continuous piping so as to avoid the exposure of the liquid or its vapors. Gravity discharge is more hazardous than handling by means of pumps.

Board of Commissioners, Ord. 875. Approved Dec. 5, 1916. *Idem.*

PART XLI.

Storage and Handling of Dynamite, Gun Powder, Etc.

551. No person, firm or corporation keeping dynamite, nitroglycerine or similar high explosives for sale or other purposes shall store or permit to be stored within the City of Nashville any such explosives within a building used for any other purpose, and not more than ten pounds of such explosives, either singly or collectively, shall be stored within any building located within the corporate limits of this City at any time.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

552. All electric or other blasting caps must be kept in a separate fireproof receptacle.

Idem.

553. No person, firm or corporation keeping gun or blasting powder, or similar explosives for sale or otherwise shall store or permit to be stored in any building within the corporate limits of the City of Nashville, more than twenty-five (25) pounds of such explosives singly or collectively at any time, and such explosives shall be in a substantial metallic canister.

Idem.

554. Any persons, firm or corporation selling or storing gun powder shall obtain a permit from the Supervisor of Buildings who shall inspect the place where same is to be kept, and such person, firm or corporation shall fully disclose to said Supervisor where such explosive is kept both in day and night time.

Idem.

555. *Gas Pipes.*

1. Every building, in which gas is used for lighting or heating, shall have each supply pipe leading from the street mains provided with a heavy brass straight-way stopcock or valve placed in the sidewalk at or near the curb, and arranged to permit shutting off at that point.

2. No gas, water, or other pipes shall be let into wooden beams placed within 36 inches of the end of the beams, and in no case shall the pipes be let into any beam more than one-fifth of its depth.

Idem.

556. *Installation of Gas Pipes and Gas Appliances.*

1. All outlets and risers shall be left capped until covered by fixtures.

2. Ground joint unions or running threads shall be used. Where necessary to cut out for repair of leaks, or making extensions, pipe shall be again put together with ground joint unions or running threads.

3. All gas burners shall be placed at least 3 feet below any woodwork or ceiling attached to wooden beams, unless the same is properly protected by a shield, in which case the distance shall be not less than 18 inches.

4. No swinging or folding gas bracket shall be placed against or near any stud partition or woodwork.

5. No gas bracket on any lath and plaster partition or woodwork shall be less than 6 inches in length measured from the burner to the plaster surface or woodwork.

6. Gaslights placed near window curtains or any other combustible material shall be guarded by globes or wire cages.

7. Gas connections to stoves and similar heating devices shall be made by rigid metal pipes. For small portable gas heating devices, flexible metal or rubber tubing may be used when there is no valve or other shut-off on the device.

8. All gas, gasoline, oil, or charcoal burning stoves or heating devices shall be placed on iron stands at a standard height above combustible supports, provided that fire pots and charcoal burners be placed 4 inches above any combustible surface and have ventilators and metal guards at least on such above combustible support.

9. No open flame heating or lighting device shall be used in any room where gasoline or other volatile inflammable fluids are stored or handled.

10. No meter shall be set by any gas company until a certificate is filed with them from the Department of Buildings certifying that the gas pipes and fixtures comply with the foregoing rules.

Idem.

PART XLII.

Enclosures Around Elevator Shaftways, in General.

557. The shaftways of all elevators shall be enclosed throughout their height with walls of brick, or terra cotta, or wire lath and plaster, or wired glass set in metal frames or other fire-resisting construction, except (1) elevators serving only two adjacent stories; (2) elevators within the wellways of surrounding stairs; (3) elevators of carriage type and of hatchway type; (4) elevators outside of buildings; and (5) that part of a dumb-waiter shaftway located between the floor and a counter-top.

The details of construction, thickness of walls, thickness, size and method of setting wired glass, etc., shall conform to the requirements of this Code. Two or more elevators may be installed in the same shaftway without partitions between them.

Elevator machine rooms, opening to shaftways, must be enclosed with fire-resisting construction.

2. Fire-resisting shaftway enclosures shall be extended through and at least 3 feet above the roof if the elevator serves the top story of the building, except in the case of a dumb-waiter shaftway terminating under a counter-top, and except where a solid platform is located under the machinery and sheaves at the top of the shaftway entirely blocking it except for the openings for cables.

3. If the fire-resisting shaftway enclosures continue through the roof, a skylight or skylights shall be located in the top of the shaftway, or a window or windows shall be located in the side walls of the enclosures, at the top, unless there is a solid platform at the top of the shaftway entirely blocking it except for openings for cables, etc. The total glass area of such skylights or windows shall be in each case (1) not less than one-half the area of the shaftway; (2) not less than three square feet if the area of the shaftway is three square feet or more; and (3) the full area of the shaftway if the latter is less than three square feet.

4. If there is a solid platform under the machinery and sheaves at the top of the shaftway entirely blocking it except for the openings for cables, etc., windows of construction and as nearly as possible the area specified herein shall be installed in the shaftway immediately below such solid floor, and either in the outside wall of the building or above the roof.

Idem.

558. *Enclosures Around Shaftways of Elevators Serving Only two Adjacent Stories.*

1. The shaftways of elevators serving only two adjacent stories shall be enclosed throughout the entire height of, at least, one of the two stories with fire-resisting construction as herein provided, except shaftways around dumb-waiters or elevators of carriage type and of hatchway type, or elevators outside of building.

Idem.

559. *Enclosures Around Elevator Shaftways in Stairwells.*

1. The shaftways of all elevators within the wellways of surrounding stairs shall be enclosed in each story with fire-resisting construction, as herein provided.

2. All such enclosures shall extend from floor to ceiling on all sides.

Idem.

560. *Enclosures Around Shaftways of Carriage-type Elevators.*

1. The shaftways of carriage-type elevators which serve two floors only need not be enclosed except that the sides of the floor opening shall be protected by guards not less than 3 feet and 4 inches above the floor, such as grille work, sheathing, wood or metal double-rail fences, etc., securely fastened in place.

2. The shaftways of carriage-type elevators which serve more than two floors shall be completely enclosed from the second story floor up with fire-resisting construction such as specified herein.

Idem.

PART XLIII.

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561. *Signs, Sign-Bulletins, Billboards and Fences.*

1. No signs, sign-bulletin or billboards or fences of any character shall be erected in the City of Nashville which in any way endangers or conflicts with public safety or convenience.

2. No person, firm or corporation, shall erect or permit to be erected any sign, sign-bulletin, billboard, structure or device for any purpose without the filing of plans and specifications of same with the Building Inspection Department and obtaining a permit therefor.

3. And the name of the contractor shall be painted on all signs.

Idem.

562. *Horizontal Signs.*

1. Horizontal signs for the front or face of buildings (such as are commonly used by merchants or other similar class of business) shall not be over 30 inches in height and placed in the solid wall spaces between the heads and sills of windows, or other openings used for ingress or egress, light or ventilation.

2. And in no case shall such sign project above the top of any window sill or cover any part of such opening as hereinabove stated.

3. All such signs shall be secured with sufficient expansion bolts which shall be let into the walls at least four inches in sufficient numbers to properly secure the said sign.

4. Or said sign shall rest in and be bolted to strong, heavy metal brackets or saddles set not over six feet apart, each of which shall be securely bolted to the walls or steel girders with expansion bolts as above stated.

5. Or with stud bolts with sufficient capacity if secured to steel construction.

6. And in no case shall any signs whatsoever be secured with wire, strips of wood, nails or sign hooks driven into the walls, or other structural parts of building, or any other such or similar or temporary construction.

7. And no pediment or parasite sign shall be hung or secured to any sign.

Idem.

563. *Pilaster Signs.*

1. Pilaster or panel signs are permissible on the face of a flat brick or stone pilaster of a business house, and must not project above the top of any sill or below the tops of windows or doors, or any opening used for ingress or egress, light or ventilation.

2. And must be secured flat against the face of such walls with a good and sufficient number of heavy expansion bolts which shall be let into the walls at least four inches deep.

3. And in no case shall such signs be secured with wire, strips of wood, nails or sign hooks driven in the walls or other structural parts of the building.

Idem.

564. *Shingle Signs.*—Sheet metal signs of a single thickness not over No. 16 gauge of the type known as "shingle signs" containing

not over four square feet, may be erected and placed not less than nine feet above the sidewalk line, and projecting the building line not more than two feet, and must be secured with proper metal bolts, anchors and stays.

Idem.

565. *Sky Signs.*

1. Sky signs may be placed on tops of buildings (provided the written permission of the owner or owners is obtained and filed with the Building Inspection Department) with the application for a permit, and no permit shall be granted until such owner's consent is filed.

2. Any letter, word, model, sign, device or representation in the nature of an advertisement, announcement or direction, supported or attached wholly or in part over or above any wall, building or structure, shall be deemed to be a sky-sign.

3. Except as herein specified sky signs shall be constructed of metal including the supports and braces for same, and no sky sign shall project beyond the building line, and the sign body shall be of open metal work and may have illuminated letters or figures properly secured on the face thereof. *Provided,* that sky signs of sheet metal as provided in Section 562, paragraph 1, may be constructed with a body not over four feet high, with an open air space underneath, not less than 2 feet, 6 inches high, making a total height of 6 feet, 6 inches to the extreme top of the completed sign, the supports and bracing shall be the same as for other sky-signs as herein provided.

4. No sky-sign shall be supported, anchored or braced to the wooden beams or other framework of a building which is over three stories high.

5. Sky-signs shall be set back at least four feet from the face of the wall on a street, alley or court front, and shall have a space at least 6 feet in height between the bottom of the sign and the roof and not over 50 feet total in height.

6. All such signs shall be designed to withstand a wind pressure of at least 30 pounds per square foot of surface.

Board of Commissioners, Ord. 832. Approved Oct. 24, 1916.
Idem.

566. Plans and specifications showing a comprehensive construction and detail shall be filed with, and approved by the Building Inspection Department for each and every sign.

Idem.

567. No signs, bulletins or billboards erected upon uprights on a vacant lot or any other supports extending into the ground, shall be at any point more than 13 feet above the surface of the ground, and shall have at least two feet of open space next to the ground line.

2. No sign bulletins or billboards shall be nearer to the lot line on any street than the house line adjoining the same, and lines of residences shall take precedence in establishing said line.

3. In no case shall any sign bulletin or billboard located in a residence section be less than fifteen (15) feet from the street line.

4. Where new buildings are erected, present sign bulletins or billboards shall be set back to new house line.

Board of Commissioners, Ord. 759. Approved June 7, 1916.

568. No matter shall be painted or posted on any sign bulletin, billboard, or structure that is licentious, vulgar or obscene, or depicting the commission of any crime, and no matter shall be painted or posted on any such sign bulletin or billboard structures until it has been inspected and approved by the Supervisor.

Idem.

569. No fence, sign, sign bulletin or billboard within the City limits shall be used for or converted into a wall of or for a shed or building of any kind.

Idem.

570. Fences shall not be more than seven (7) feet in height.

Idem.

571. Sign bulletins, billboards and fences which were constructed prior to the enactment of this ordinance, and which were in accord with the previous ordinance may be permitted to remain, and they shall be kept in repair as herein provided.

2. No sign bulletin or billboard of any character shall be placed on top of another sign, sign bulletin or billboard.

Idem.

572. *Illuminated Signs.*

1. Electric or gas illuminated signs only may project from, and at right angles to the front of business houses, and shall not project further out than twelve inches of curb line or be less than nine feet above the sidewalk.

2. Such signs shall be made of metal with all intersections securely bolted and soldered together, and any glass used therein (over 12x12

inches) shall have woven wire in the entire body thereof and such glass shall not be less than 3/16-inch thick.

3. Suspension rods of such signs shall pass through the wall of the building and be secured with bolt washers and nuts on inside of such walls, or if to steel work then by steel angles and threaded bolts, and all junctions of suspension and other structural work shall be securely bolted together with bolted cable clips or similar bolted construction.

Idem.

573. 1. The owner or operator of such electric or gas illuminated sign shall sign a statement agreeing to cut in and use current or gas as soon as sign is hung in place, under a penalty fine for non-compliance.

2. Only one illuminated sign shall be attached to, suspended, or projected from the front of any one business house.

3. No illuminated sign shall remain if the lights thereof are not kept burning regular from 6:30 P.M. to 10 P.M. each and every night, but shall be removed by the owner or agent.

Idem.

574. *Provided,* that bracket signs not over 36 inches high, and secured to the wall with bolts and brackets and not projecting the property line more than twenty inches, may be placed not less than seven feet above the sidewalk grade.

Idem.

575. *Cloth Signs.*—Temporary cloth signs for advertising purposes may be permitted on the fronts of buildings not over three feet wide and do not cover or obstruct any doors, windows or transoms; (*provided,* that this shall not apply to solid transom over show windows of stores), such signs shall not be placed on any wooden frame, but shall be secured with corrugated nails and large tin washers, and shall be removed, within twenty-four hours after written notice from the Supervisor; *provided,* that no such cloth signs shall remain on any building or structure longer than 30 days.

Idem.

576. No sign, billboard, dodger or advertising matter whatsoever, shall be placed on any pile of building material, post or shed, where building or structural work is being, or preparing to be done.

Idem.

577. No sign, banner, flag or other contrivance for advertising purposes shall be erected or suspended across any street, alley or public space.

2. No sign of any character shall be erected on the front or face of any building in such way as to cover or obscure any window, door or opening, or any part thereof.

Idem.

578. *Materials for Signs.*

1. All exposed surfaces of signs hereafter erected and attached to buildings and structures within the City of Nashville shall be of some incombustible material, such as tinplate, galvanized or enameled iron, sheet or cast, copper or brass (*provided* that signs having wooden letters placed on metal surfaces and properly riveted shall be permissible), and a frame work for the purpose of receiving the metal face of such signs shall be constructed of angle steel and all riveting and securing of angles and face metal shall be done with rust-proof rivets.

2. All signs, sign bulletins and billboards shall be permanently secured, supported, braced and otherwise rigidly constructed using galvanized nails to secure face work to frame, and sound heart lumber for all rails, braces and posts.

3. All connections to woodwork, sign bulletins, or billboards shall be by steel angle plates properly secured to woodwork with 60-d nails, bolts or lag screws, and no post for billboards or sign bulletins shall be less than 4x4 inches at its smallest point, and set not less than three feet in ground; to be of cedar, locust or other durable material.

4. Nor shall any billboard or sign bulletin be secured with wooden strips or light wire, or any part thereof extend over the property line.

Idem.

579. *Flag Poles.*—Permanent flag poles of approved metal construction may be erected and flags or pennants may be attached thereto with one end free.

Idem.

580. *Tents.*

1. It shall be unlawful to erect a tent within the First Zone of the fire district. The Supervisor may, at his discretion, grant permits to a person or persons for the purpose of erecting tents outside of the First Zone;

2. *Provided,* however, that before any such permit shall be issued the person desiring the permit shall pay to the City Treasurer the lawful tax or fee thereon, and shall state in writing the purpose for which he desires to use said tent, and shall also file with the Supervisor the written consent of such person or persons owning and occupying the property adjoining the place where it is proposed to erect said tent.

3. Any person erecting a tent excepting as herein provided, shall be guilty of a misdemeanor, and upon conviction shall be fined as provided by ordinance.

Idem.

581. *Bond for Sign or Awning Business.*

1. Every person, firm or corporation engaged in the business of erecting, manufacturing, painting or hanging signs, signboards, illuminated signs, sign bulletins, billboards or awnings, shall file a good and sufficient surety bond in the penal sum of Five Thousand Dollars with the Board of Commissioners for the purpose of indemnifying, saving and keeping the City of Nashville harmless and free of costs, damages or expenses of any or all kinds which may be suffered by the City because of neglect, bad construction, or workmanship on the part of such person, firm or corporation in the construction, repairs, or maintenance of such signs, sign bulletins, sign boards, illuminated signs or billboards, or awnings.

2. Such bond shall be for twelve months, and renewed annually thereafter.

3. No permit shall be issued to any person or firm to erect signs, sign bulletins, billboards, or awnings until such bond is filed.

4. And every person engaged in the sign bulletin or billboard business shall within two months (from date of this ordinance) file a schedule of all bulletins or billboards, owned and controlled by them, the sign location, and expiration date of such contracts.

Idem.

582. *Awnings.*

1. Where cloth covered awnings are attached to buildings, the framework shall be of metal, and all awnings in the corporate limits shall be Italian awnings, or awnings such as may be folded back against the front of the building on which said awning is placed, when not in use, and shall not be less than eight feet above the sidewalk when open.

2. All such awnings shall be securely framed and bolted together, and to the structural parts of the building.

3. And no stationary awning or shed awning of wooden construction shall be allowed or maintained in the City of Nashville.

4. And no permit shall be issued to repair such shed or awning.

5. And all such wooden sheds or metal frames of stationary design shall be removed within 6 months after passage of this ordinance.

Idem.

PART XLIV.

583. *Marquise.*—Marquise may be erected over the front entrance of a store, hotel, flat or apartment house, or any public building, and may project over the sidewalk to within two feet of the curb line at its widest projecting point beyond the building line.

2. Said marquise shall not front the street more than one-half the width of any building that has a frontage of thirty feet or less, and if said frontage be more than thirty feet, then the marquise may have a frontage width of not over one-third of the frontage width of the building.

3. *Provided,* that the remainder of such frontage space may have a continuing projection of not over 3 feet beyond the wall line and placed on same line of, and be a continuance of the marquise proper.

4. No marquise shall be less than nine feet above the sidewalk at the lowest point.

5. Said marquise shall be made entirely of metal framing and metal ornamental work well secured to the building and shall be roofed in with heavy wired glass, not less than three-eights inch thick and not over sixteen inches wide for each sheet, which shall be carefully embedded in a proper waterproof setting and shall have necessary valleys, gutters, and down pipes to completely drain all water to the gutter, or sewer.

Idem.

PART XLV.

Protection of Workmen and the Public.

584. *Provision for Safety.*

1. Fireproof floor construction shall follow up the erection of the steel framing of all structures within two complete tiers.

2. If filling with brick or other fireproof material is not required between floor beams, the under flooring or other planking shall be laid in each story as the building progresses.

3. If the floor construction is of structural steel, the contractor for the steel work or the owner of building in course of erection shall thoroughly plank the entire tier of steel beams on which the structural work is being erected, except such spaces as may be reasonably required for hoisting materials and other erection work.

4. All openings in the floor framing intended for stairways, elevators or for other shafts shall be planked over or enclosed on all sides to a height of at least 3 feet.

5. If elevating or hoisting apparatus is used for the purpose of lifting materials within a building under construction, the shafts or openings in each floor shall be inclosed or fenced by a substantial barrier at least 6 feet high, except two sides for the handling of materials. These sides shall be guarded by an adjustable barrier not less than 3 feet high above the floor and not less than 2 feet from the edge of such shaft or opening.

Idem.

585. *Strength of Temporary Supports.*—Every temporary support placed under any structure, wall, girder or beam, during the erection, alteration, demolition, or repair of any building or structure or any part thereof, shall be of sufficient strength for safely carrying the load to be placed thereon.

Idem.

586. *Overloading to be Avoided.*—During the construction or alteration of any building or structure no material entering into such construction or alteration shall be placed on any floor in excess of the live load that such floor is intended to safely sustain.

Idem.

587. *Outside Scaffolds.*—Whenever outside scaffolds are used on buildings over 40 feet in height, whether they be suspended or constructed of poles and thrustouts, they shall be provided with a substantial guard railing or enclosure of wire mesh or other suitable material, extending 4 feet above the working platform on its outer edge and ends. All such scaffolds shall be constructed in a manner to secure the safety of the workmen on them and the people using the street, *provided* that swinging scaffolds 30 feet or less in length shall not be included as above.

Idem.

PART XLVI.

Tenement House Law.

588. *Scope of Law.*

1. An ordinance controlling the construction and use of tenement and apartment houses.

2. This ordinance shall be known and cited as the Tenement House Law, and provides regulations affecting the light, ventilation, protection from fire, means of egress, and sanitation of tenement houses. Except as herein otherwise provided, every tenement house shall be constructed and maintained in confirmity with the special provisions of this ordinance, and in accordance with all other requirements of this Code of which the Tenement House Law forms an integral part.

Idem.

589. *Class of Construction Required.*

1. Fireproof Tenements. Every building erected or altered for use as a tenement house exceeding 3 stories in height, shall be constructed fireproof in accordance with the requirements of this Code for fireproof buildings.

2. Non-fireproof Tenements. All non-fireproof tenement houses erected or altered having a height of three stories or less shall have the first floor slab above the cellar or lowest story of fireproof construction.

Idem.

590. *Buildings Converted or Altered.*

1. A building not a tenement house, if converted or altered to such use, shall thereupon become subject to all the provisions of this Code affecting tenement houses hereafter erected.

2. No tenement house shall at any time be altered so as to be in violation of any provision of this Code. If any tenement house or any part thereof is occupied by more families than provided in this ordinance, or is erected, altered or occupied contrary to law, such tenement house shall be considered an unlawful structure, and the Supervisor may cause such building to be vacated. Such building shall not again be occupied until it or its occupation as the case may be, conforms to the law.

Idem.

591. *Light and Ventilation.*

1. Percentage of Lot Occupied. No tenement house shall occupy, either alone or with other buildings, except as otherwise provided in the sections prescribing the measurements for yards and courts, a greater percentage of the area of the lot than as follows:

(a) In the case of a corner lot, not more than 90 per cent.

(b) In the case of an interior lot which exceeds 90 feet in depth and does not exceed 105 feet in depth, not more than 70 per cent.

(c) In the case of an interior lot which exceeds 105 feet in depth, not more than 65 per cent.

2. The space occupied by outside exit stairways shall not be considered a part of the lot occupied. For the purposes of this section the measurements shall be taken at the ground level, except that where such a building has no basement, and the cellar ceiling is not more than 2 feet above the curb level, the measurements may be taken at the level of the second tier of beams. The provisions of this section shall not apply to a tenement house running through from one street to another street, *provided* that the lot on which it is situated does not exceed 100 feet in depth.

Idem.

592. *Height, and Pent Houses.*

1. The height of a tenement house shall not exceed one and one-half times the width of the widest street upon which it stands and in no case exceed 125 feet. Pergolas or similar open ornamental treatment of roof gardens or playgrounds shall not be considered as affecting such height.

2. If there are pent houses or superstructures, other than bulkheads, exceeding 10 feet in height or covering an aggregate area greater than 10 per cent. of the area of the roof, the height measurement shall be taken to the top of the highest of such pent houses or superstructures.

3. A pent house, erected on the roof of a fireproof tenement house in which one or more passenger elevators are operated, shall not be considered as affecting the height measurement of the building, *provided* the pent house complies with the following requirements:

(a) The pent house, including all the bulkheads shall not cover more than 50 per cent. of the area of the main roof.

(b) The pent house shall be set back at least 10 feet from both the front and rear walls of the building, and at least 3 feet from

any court wall, and shall have a clear inside height of not less than 9 feet from finished floor to finished ceiling, and shall not exceed 12 feet in height from the highest point of the main roof to the highest point of the pent house roof.

(c) The pent house shall be entirely of fireproof construction.

(d) The pent house shall not be used or rented as apartments, but its use shall be limited solely to laundry and store room purposes, and to servants' and janitors' quarters.

Idem.

593. *Yards.*

1. Behind every tenement house, unless abutting on a street or alley, there shall be a yard extending across the entire width of the lot. Except upon a corner lot, such yard shall have an unobstructed opening from every point to the sky, except that an unenclosed outside stairway, serving as a fire escape exit, or a bridge or platform not exceeding 4 feet in width may extend above the yard from the roof of a tenement house to the roof of an adjoining or abutting building, without prejudice to this requirement.

2. The depth of said yard, measured from the extreme rear wall of the house to the rear line of the lot shall be as follows:

(a) Except upon a corner lot, the depth of the yard behind every tenement house not exceeding 36 feet in height, shall be not less than 10 feet.

Idem.

594. *Courts.*—No court of a tenement house shall be covered by a roof or skylight, but every such court shall be at every point open from the ground to the sky unobstructed, except by an outside exit stairway.

Idem.

595. *Public Hallways, Width of.*

1. Every entrance hallway shall be at least 4 feet wide in the clear, from the main entrance to the stairway enclosure. If such entrance hallway is the only entrance to more than one stairway, that portion of said hallway between the entrance and the first stairway, shall be increased in width one-half for each additional stairway it serves.

2. In all tenement houses, public hallways serving as means of egress for not more than three apartments on one floor shall be 44

inches wide in the clear; and for every additional apartment so served on such floor the width shall be increased 8 inches.

3. For doorways serving such hallways, see Section 300, paragraph 3.

Idem.

596. *Stairways.*

1. In every tenement house all stairways shall extend from the entrance floor to the roof, and the stairs shall be at least 48 inches wide in the clear. Each apartment in every story shall have direct access to such stairways.

2. Each stairway shall have an exit to the street at the street level, or to a court or yard which connects directly with the street.

3. In non-fireproof tenement houses no closet of any kind shall be constructed under any stairway leading from the entrance story to the upper stories, but such space shall be left entirely open and free from incumbrance.

Idem.

597. *Stairways, Number of.*—Every tenement house containing not more than twenty apartments or suites of rooms above the entrance floor shall have at least one interior stairway, and for every additional twenty apartments or fraction thereof, one additional stairway shall be provided. If such house contains not more than thirty apartments above the entrance floor, in lieu of an additional stairway, the entrance hallway and stair hallway may each be made one-half wider than specified in Section 301.

Idem.

598. *Cellar and Basement Stairways.*—In every tenement house there shall be an outside entrance to the cellar or other lowest story.

Idem.

599. *Stairs, Construction of.*—All stairs for tenement houses shall be constructed in accordance with the requirements of Section 301.

Idem.

600. *Lighting of Public Hallways.*

1. In a fireproof tenement house in which one or more passenger elevators are provided, elevator vestibules or hallways not less than 5 feet in minimum dimension and not exceeding in any dimension

twice the width of the elevator shafts which they serve, may be permitted without a window to the outer air, provided such elevator vestibules are completely shut off from all other parts of the house by approved fireproof enclosures; and provided that such elevator vestibules are ventilated to the outer air by means of vent flues not less than 12 inches square; and provided that such elevator vestibules are equipped with wires, pipes and fixtures for both gas and electric lighting, and are kept properly lighted by electric light.

2. In every tenement house a proper light shall be kept burning by the owner in the public hallways near the stairs upon the entrance floor, and upon every floor above the entrance floor, every night from dark to dawn throughout the year; also upon all other floors from sunset until ten o'clock in the evening. This paragraph shall apply to existing tenements as well as those hereafter erected.

Idem.

601. *Skylights for Public Hallways.*—In every tenement house there shall be placed in the roof, directly over each stair-shaft, a ventilating skylight provided with ridge ventilators having a minimum opening of 40 square inches, or such skylight shall be provided with fixed or movable louvres; the glazed roof of such skylights shall not be less than 20 square feet in area. In existing tenement houses where the stairs and public hallways are not provided with windows on each floor, opening directly to the outer air, the skylights shall be provided with both ridge ventilators and with fixed or movable louvres or movable sashes.

Idem.

602. *Lighting and Ventilation of Rooms.*

1. In every tenement house, every room including water-closet compartments and bath-rooms, shall have at least one window opening directly upon the street or upon a yard or court of the dimensions hereinbefore specified; and such window shall be so located as to properly light all portions of such rooms. In addition to the above requirement, no apartment of three rooms or less shall extend in depth from the street or yard, as the case may be, for a greater distance than 18 feet without the intervention of an inner or outer court adjoining said room, constructed as required by this ordinance.

2. Wherever a room in a tenement house opens upon an inner court less than 10 feet wide, measured from the lot line to the opposite wall of the building, such room shall be provided with a sash window, communicating with another room in the same apartment,

such window to contain not less than 10 square feet of glazed surface, and arranged to open easily.

3. The total window area in each room, except water-closet compartments and bath-rooms, shall be at least one-tenth of the superficial area of the room, and the top of at least one window, shall not be less than 7 feet, 6 inches above the floor; and the upper half of it shall be made to open the full width. No such window shall be less than 12 square feet in area between the stopbeads. Transom or partition sash to private hallways or to adjoining rooms shall be provided to secure thorough ventilation, when required by the Supervisor; but no such transom or sash window shall be required in rooms containing two windows, *provided* each window contains 12 square feet of area between stop-heads, or in the case of a mullioned window containing 24 square feet.

4. No tenement house shall be so altered that any room, or public hallway or stairs, shall have its light or ventilation diminished in any way not approved by the Supervisor.

Idem.

603. *Exits Required.*

1. In all tenement houses every apartment or suite of rooms above the entrance floor shall have at least two independent means of egress located remote from each other and extending continuously to the street, or to a court or yard connected with the street, so arragned that each may be reached from the same apartment without having to pass the other. One of such means of egress shall be an interior stairway constructed and arranged as specified in Sections 595 to 599, inclusive. The other may be an additional interior stairway constructed the same as the first, or a smokeproof tower, an outside exit stairway, or a horizontal exit, as specified in Sections 301 to 309, inclusive.

2. The second means of exit shall be so located and arranged as to connect directly to at least one room or private hallway in each story above the first. Such room or private hallway shall be accessible to every room of the apartment without passing through a public hallway. The connection shall not be made through a bath-room or water-closet compartment. Access to exits shall not be obstructed in any manner.

Idem.

604. *Partitions in Non-fireproof Tenements.*—Apartment partitions in non-fireproof tenement houses shall be constructed as specified in Section 380.

Apartment partitions within the meaning of this section are partitions crossing the floor beams at any angle, and designed to separate apartment from apartment, or any part of an apartment from the public hallway or other public part of the building.

Idem.

605. *Chimneys, Fireplaces and Flues.*—In tenement houses not heated by steam, hot water or hot air every apartment shall be provided with an open fireplace or grate or a stove pipe connection with a lawful flue or chimney. Under no circumstances shall a gas stove be directly connected with a flue that communicates with another apartment.

Idem.

606. *Vent Flues.*—In a fireproof tenement house water-closets and bath-rooms which are supplementary to those required by law may be ventilated by individual vent flues extending independently of any other flue, to and above the roof. Such vent flues shall not be covered at the top, but may be provided with a hood or louvres.

Idem.

607. *Shafts.*—All shafts in tenement houses shall be constructed as provided in Sections 353-356.

Idem.

608. *Frame Tenement and Tenements Prohibited on Lot With Frame Buildings.*

1. No existing frame tenement house within the fire limits shall be enlarged or raised, except as provided in Section 452.

2. Frame tenements are prohibited. For limitations on frame dwellings outside the fire limits See Section 454.

Idem.

609. *Storage of Dangerous or Combustible Materials Prohibited in Tenements.*—No part of any tenement house, nor of the lot upon which it is situated, shall be used as a place of storage, or handling of any article dangerous or detrimental to life or health, nor for the storage, or handling of feed, hay, straw, excelsior, lumber, cotton, paper, feathers, rags or other inflammable material. This section applies to existing tenements and those hereafter erected.

Idem.

610. *Tenement Houses Enlarged or Altered.*

1. No tenement house shall be enlarged, or its lot be diminished, so that a greater percentage of the lot shall be occupied by buildings

or structures than is permitted in Section 591, *provided* that the space occupied by outside exit stairways, and by chimneys or flues located in yards and attached to the houses and which do not exceed 5 square feet in area and do not obstruct light or ventilation, shall not be considerer a part of the lot occupied.

2. Any additional room constructed in a tenement house, shall comply in all respects with the provisions of this ordinance except that such room may be of the same height as the other rooms on the same story of the house.

3. No room in a tenement house erected prior to the adoption of this ordinance shall be occupied for living purposes unless it shall have a window opening directly upon the street, or upon a yard not less than 4 feet deep, or above the roof of an adjoining building, or upon a court or shaft of not less than 20 square feet in area, open to the sky, without roof or skylight.

4. Any shaft hereafter constructed in an existing tenement house, for lighting or ventilating rooms used for living purposes, shall be not less than 25 square feet in area, nor less than 4 feet wide in any part, and such shaft shall under no circumstances be roofed or covered at the top with a roof or skylight; every such shaft shall be provided at the bottom with a horizontal intake or duct, of a size not less than 4 square feet, and communicating directly with the street or yard; such duct shall be so arranged as to be easily cleaned out. Such shafts shall be of fire-resistive construction as provided in Sections 330-333.

Idem.

611. *Structural Requirements.*—All structural details for tenement houses which are not specifically treated in this ordinance known as the "Tenement House Law" shall be subject to the requirements of the various sections of this Code dealing with such details, and the construction shall in every way conform to the provisions therein contained.

Idem.

612. *Water Supply.*—In every tenement house there shall be in each apartment a proper sink with running water. The owner shall provide proper and suitable tanks, pumps or other appliances necessary to receive and distribute an adequate and sufficient supply of such water in each apartment, at all times of the year, during all hours of the day and night.

Idem.

613. *Water-closet Accommodations.*

1. In every tenement house there shall be a separate water-closet in a separate compartment within each apartment. Every water-closet and bath hereafter installed in any tenement house shall be placed in a compartment completely separated from every other water-closet and bath; such compartment shall be inclosed with plastered partitions extending to the ceiling and shall have a window opening directly upon the street or yard, or upon a court of the dimensions hereinbefore specified. Such compartment shall also be provided with proper means of lighting.

2. The floor of every water-closet compartment shall be made waterproof with asphalt, tile, stone or other approved material; such waterproofing shall extend up the walls at least 6 inches above the floor. No drip tray shall be permitted. No water-closet fixtures shall be inclosed with woodwork.

Idem.

614. *Cellars.*

1. In tenement houses all walls below the ground level and the cellar or lowest floor shall be made damp-proof. The entire cellar or lowest floor shall also be covered with a bed of good concrete at least 4 inches thick, troweled to an even surface. All cellars shall be properly lighted and ventilated.

2. In tenement houses there shall be not more than one apartment in the cellar and this shall contain not more than five rooms and bath, and shall be occupied solely by the janitor and his family and no other rooms in the cellar shall be occupied for living or sleeping purposes.

3. No room in the cellar shall be occupied for living purposes, unless all of the following conditions are complied with:

(a) Such room shall be at least 9 feet high in the clear and its ceiling shall be in every part at least 4 feet above the curb level of the street in front of the building, or 4 feet above yard grade, when such room is located in the front part of the building; if such room is located in the rear of the building, the ceiling shall be not less than 2 feet above the curb level of the street in the front of the building, and the yard or court upon which such room opens shall extend to a point 6 inches below the floor level of said room.

(b) Every such room shall be an integral part of an apartment containing a room having a window opening directly to the street or yard.

(c) There shall be appurtenant to such room the use of a separate water-closet.

(d) Such room shall have a window opening upon the street, or upon a yard or court; and the area of the window shall be not less than 12 square feet below stop beads. The upper half of such window shall open by means of a vertically sliding pulley hung sash.

Idem.

615. *Care of Walls and Ceilings.*—The cellar walls and ceilings of every tenement house, and the walls of all yard courts, inner courts, and shafts connected with tenement houses, unless built of light colored brick, stone, or concrete, shall be thoroughly whitewashed or painted a light color by the owner, and shall be so maintained.

Idem.

616. *Shafts, Courts, Areas, and Yards.*

1. In every tenement house the bottom of all shafts, courts, areas, and yards which extend to the basement for light or ventilation of living rooms, shall be 6 inches below the floor level of the part occupied. In every tenement house all shafts, courts, areas, and yards shall be properly concreted, graded, drained, and connected with the street sewer where practicable.

2. In every tenement house there shall be at the bottom of every shaft and inner court an approved self-closing fire door giving sufficient access to such shaft or court to enable it to be properly cleaned.

Idem.

617. *Roofs.*—The roof of every tenement house shall be maintained water-tight, and the rain water therefrom shall not be permitted to discharge into the yards or courts.

Idem.

PART XLVII.

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618. *Drilling and Blasting.*—It is unlawful for any person, firm or corporation to do any work at drilling or blasting of rock with any explosives whatsoever between the hours of 6 P.M. and 6 A.M. within the City limits, and all such lawful blasting shall be properly covered and barricaded before completing the blast.

Idem.

PART XLVIII.

619. *Work on the Sabbath Day.*—No contractor, owner, workman, laborer or person whatsoever shall do any work or labor on any building, structure, or works within the City between the hours of 12 P.M. Saturday night and 12 P.M. Sunday night.

Idem.

PART XLIX.

620. *Electrical Installations.*—That the office of Electrical Inspector is hereby created. He shall be elected by the Board of Commissioners, and nominated by the Commissioner of Fire, Street Sprinkling and Building Inspection, and is under his supervision and control. His salary shall be not more than $1,500 per annum, payable as provided by ordinance. He shall give bond in the sum of two thousand ($2,000.00) dollars, with surety thereon, signed by an indemnity insurance company authorized to transact business in the State of Tennessee, conditioned that said officer will faithfully discharge the duties that are now or may hereafter be imposed upon him, and all liability that may accrue by reason of his office. Said bond shall be approved by the Board of Commissioners as provided by Charter.

Board of Commissioners, Ord. 916. Approved Feb. 13, 1917.

Idem.

621. The Electrical Inspector shall proceed to make proper inspection upon the exhibition to him of the permit, and he shall issue a certificate with his approval when the work is found by him to be in accordance with the ordinances of the City. No permit shall be granted, for any electric sign, picture machine, theatre booth, or similar structure, either interior or exterior, until the Electical Inspector and the other inspection departments, whose approval is required, shall have examined, passed on, and approved the applications, plans and specifications, and shall also be prepared to give their certificate of approval, all of which shall be based on the ordinances of the City of Nashville. If such applications, plans and specifications do not appear to conform to the requirements of said ordinances, no permit shall issue until such applications, plans and specifications are made to comply with the said ordinances of the City. All permits for elec-

tric signs, booths in picture machine theatres and similar structures must be a joint permit issued from such departments as are required to inspect and approve the same.

Board of Commissioners. Approved June 7, 1916.
Idem.

622. The Electrical Inspector shall use a book of certificates in duplicate and regularly numbered as may be approved by the Commissioner, and shall retain a copy for his own records; and the owners of all electric signs and similar structures shall be entitled to a certificate from the Inspector stating that such signs or structures comply with these ordinances, at final acceptance by the Inspector.

Idem.

623. The Electrical Inspector or his authorized assistants are hereby empowered and directed to enter all buildings or structures in pursuance of the duties of their office, and to inspect all electric wiring used for the transmission of current for light, heat and power purposes that is now or hereafter installed. And a semi-annual inspection shall be made of all electric signs and structures of similar character. No person, firm or corporation shall attempt to do any electrical work, either new work, additions, alterations or changes on old work, without first applying to the Electrical Inspector and securing a permit for doing said work, and no permit shall be issued to any person, firm or corporation who has not first obtained a license to do electrical work.

The schedule of fees for inspection of electric wiring, shall be as follows:

Where wires are to be concealed (porcelain knob or tube, or installation of iron conduit) for equipment of ten outlets or less	$1.50
For each additional outlet, ten and including 25	.10
For each additional outlet over 25	.05
For opening or moulding work, for equipment of 10 or less outlets	1.00
For each additional outlet up to and including twenty-five (25)	.05
For each additional outlet over 25	.02
Arc lamps and ceiling fans, for equipment of three or less	1.00
For each additional up to and including 10	.15
For each additional over 10	.05
Motors, two horsepower or less	.50

Motors, over two horsepower up to and including five horsepower	1.00
Motors over five horsepower and up to and including ten horsepower	1.50
Motors over 10 horsepower up to and including 15 horsepower	2.00
Motors over 15 horsepower	2.50
Heaters and other electrical equipment will be charged same as motors containing 746 watts as one horsepower.	
Electric signs and structures similar thereto, each	1.00
Picture machine theatre booth	1.00
Mercury rectifiers, each	1.00
Combination or electrical fixtures, equipment of 10 or less	.50
Additional fixtures	.50

That all fees shall be certified to the City Comptroller by the Electrical Inspector; the said Electrical Inspector shall keep a copy of such certificate in a book, and the certificate shall be numbered and shall correspond with the number of the copy of the certificate furnished the City Comptroller. The fees shall be paid to the City Treasurer upon the signature on the warrant signed by the Comptroller; and said certificate upon payment of said fee shall be marked "paid," giving the date thereof. The said Electrical Inspector shall assess and receive the fees for the inspection of all other works (such as the Inspection of wiring, apparatus, machinery or structures previously erected and passed on, but in need of other inspection) and issue his receipt therefor in triplicate. He shall pay said fee into the City Treasury daily with the original voucher or certificate therefor, and present a copy to the owner or party whose premises or property has been served, and shall retain a copy for his own records; and the owners of all electric signs and similar structures shall be entitled to a certificate from the Inspector stating that such signs or structures comply with these ordinances before final settlement with the contractor.

Idem.

624. The National Electric Code rules are hereby adopted as a standard by which all wires for light, heat and power purposes shall be installed.

Idem.

625. (a) All new wiring and additions to old wiring requiring one or more new circuits shall be run in rigid iron conduit, armored

cable or metal moulding within the limits of the First Zone, and in all other sections of the City, residences and outhouses alone excepted.

(b) No person, firm or corporation shall cause any wiring for light, heat, or power purposes to be covered up, or in any manner be concealed until such wiring has been duly inspected and a notice posted to the effect that the wiring has been approved. The Inspector must approve or disapprove work installed within forty-eight hours after a written notice for such inspection.

Idem.

626. It shall be unlawful for any person, firm or corporation to place any furnace pipe, water, gas or sewer pipe, or any dangerous material in contact with any electrical apparatus or wires, or cause such apparatus or wires to be cut, disconnected or disarranged in any manner without first notifying the Electrical Inspector in writing. It shall be unlawful for any person, firm or corporation to furnish or connect an electric current to the wiring on any building or structure, whether on the interior or exterior of such building or structure until said wires are first duly inspected and a written permit issued, allowing current to be supplied.

Idem.

627. *Temporary Certificates.*—If the Electrical Inspector or his qualified representatives shall be unable to inspect any electrical work within twenty-four hours after notice of its completion, he may issue a temporary permit allowing current to be turned on pending the inspection of such work.

Idem.

628. 1. All dynamos, motors, wires or other machinery, apparatus or material used for electrical purposes which may at any time become defective as to be likely, in the opinion of the Inspector, to cause fires or accidents, or endanger persons or property, it shall be condemned by the Inspector, when, in his opinion, it is deemed necessary.

2. In order to prevent such accident or dangers, said Inspector is hereby authorized to disconnect such wires or apparatus or to cause the same to be disconnected from service; and upon such condemnation, the person or persons owning or using the same shall immediately cause the same to be put in a safe condition. In case any person or persons owning or using any electric wires, dynamos,

motors, or other electrical apparatus, structure or material of any nature whatsoever, which have been condemned by the Electrical Inspector, shall fail to have the same put in safe condition and accepted by the said Inspector within forty-eight hours after the same has been condemned, or within such other reasonable time as shall be prescribed by the said Inspector.

3. Then, it shall be the duty of said Electrical Inspector to remove the fuses, cut the wires, or by other means completely disconnect, or cause to be disconnected, the condemned wires, apparatus or material from the source of electrical energy.

4. And when any electric wires, dynamos, motors or electrical apparatus or material of any nature whatsoever have been in any manner disconnected and rendered inoperative by the Electrical Inspector, as set forth in the foregoing provisions, it shall be unlawful for any person or persons to in any manner re-connect the same or cause the same to be re-connected to any source of electrical energy, or to use the same as a part of any electrical system, until they have been put in safe condition and certificate of acceptance has been issued by the Electrical Inspector.

Idem.

PART L.

Inspections of Boilers and Elevators.

629. *Office and Duties of Inspector of Boilers and Elevators.*

1. That the office of Boiler and Elevator Inspector is hereby created. His salary shall be $1,500.00 per annum, payable as provided by ordinance.

Board of Commissioners, Ord. 788. Approved July 13, 1916.

He shall give bond in the sum of two thousand ($2,000.00) dollars, with surety thereon, signed by an indemnity insurance company authorized to transact business in the State of Tennessee, conditioned that said officer will faithfully discharge the duties that are now or may hereafter be imposed upon him, and all liability that may accrue by reason of his office. Said bond shall be approved by the Board of Commissioners as provided by charter.

Board of Commissioners, Ord. 916. Approved Feb. 13, 1917.

The Boiler and Elevator Inspector shall be elected by the Board of Commissioners and shall be nominated by the Commissioner of Fire, Sprinkling and Building Inspection, and is under his supervision and control.

Boiler and Elevator Inspections.

2. The fees for boiler and elevator inspections shall be as follows:

Boilers for power purposes up to 40 h.p	$2.00
Boilers for power purposes over 40 h.p	3.00
Permits for erection and installation up to 40 h.p	.50
Permits for erecting or installation over 40 h.p	1.00
Heating furnaces, for inspection	.50
Heating furnaces, for permit, each	1.00
Bake ovens, for inspection	.50
Bake ovens, for permits, each	1.00
Elevators, passenger, for inspection	1.50
Elevators, passenger, for permit	50
Elevators, freight, for inspection	1.50
Elevators, freight, for permit	.50
Electric motors for elevators, inspection	.50
Electric motors for elevators, for permit	.50
Steam heating boilers over 40-hp. or subject to over 15 pounds pressure to the square inch, inspection fee	2.00
Permit fee	50
Steam heating boilers and plants for flats or apartment houses with not more than three suits of rooms each, and for private residences, not subject to more than 15 pounds pressure per square inch, inspection	.50
Permits	.50
Other steam heating boilers and plants as used in apartments of more than three suits of rooms and subject to not over 15 pounds pressure to the square inch, inspection	1.00
Permit fee	.50
Fees for permits and all inspection of alterations and reconstruction of any item will be the same as for erection, installation, or annual inspection.	
Fees for special inspection upon request will be the same as for annual or regular inspection.	

3. The Inspector of Boilers and Elevators upon receipt of money for inspection fees shall promptly deliver to every owner or user

of any boiler, certificates of inspection of a boiler inspected by him or by his assistant; every such certificate of inspection shall be properly filled in as herein provided, and signed by said Inspector, and said certificates of inspection shall be displayed in some prominent place near where the boilers are used.

4. The Inspector of Boilers and Elevators shall make weekly returns to the Comptroller of all moneys collected, giving the names of the steam users from whom collected.

5. The engineers, engines and boilers of the Fire Department and locomotive boilers used on railroads are exempt from the provisions of this ordinance.

6. The Inspector of Boilers and Elevators shall devote the whole of his time and attention to the duties of his office.

7. He shall carefully inspect and test every stationary boiler and steam generating apparatus under pressure used for stationary power, or heating as provided by this ordinance, including all attachments and connections, located within the City, at least once annually.

8. He shall keep a complete and accurate record of the names of all owners or users of steam boilers, or warm air or other furnaces, giving a full description of the boilers and furnaces inspected by him, and the amount of pressure allowed and the date when last tested.

9. He shall notify all owners or users of boilers of the time when a re-inspection and a test will be made, at least ten days before the expiration of each certificate of inspection, and appoint a day on which he will make a re-inspection.

10. The said Inspector of Boilers and Elevators shall make monthly reports to the said Commissioner of Fire, Sprinkling and Building Inspection.

Board of Commissioners, Ord. 788. Approved July 13, 1916.

630. *Manner of Inspection. Certificate.*

1. The manner of inspection shall be substantially as follows:

2. The owners of steam boilers and users shall have the option of taking the hammer test or the hydrostatic test; if the hammer test be asked for, the examination shall be thorough and searching on every part of the boiler, both internally and externally, including all fittings and attachments.

3. If the hydrostatic test be asked for, each boiler shall be tested by the hydraulic pressure one-fourth greater than the ordinary work-

ing steam pressure used, and the certificate of inspection herein provided shall state the maximum pressure at which any boiler may be worked.

4. In case a defect shall be discovered in any boiler or attachment thereto, the Inspector of Boilers and Elevators shall report the same to the owners or users of said boiler or boilers, and state the facts of the case in writing, giving a description of the particular locality in which each defect may be found, and whether of a dangerous character and necessitating immediate repair.

5. If the Inspector of Boilers and Elevators shall at any time find a boiler which, in his judgment, is unsafe, after inspecting same, he shall condemn its further use.

6. All boilers to be tested by the hydrostatic pressure shall be filled with water by the owners or users, and they shall furnish the necessary labor required to work and handle the pumps in applying the tests.

7. When leaks occur which prevent a successful test, the Inspector of Boilers and Elevators shall make a second test upon receiving notice that all leaks have been repaired.

8. If, upon making a second test, the boiler or boilers are still defective, he shall not give a certificate until fully satisfied of the safety of the boiler or boilers.

9. All certificates of inspection shall be for one year and no longer.

10. Any owner or user of any boiler or boilers insured by any steam inspection and insurance company duly authorized to transact busines in the City of Nashville, shall upon his request have the hydrostatic test applied once annually, by the Boiler Inspector, as provided in this ordinance.

Board of Commissioners, Ord. 759. Approved June 7, 1916.
Idem.

631. That it shall be unlawful for any stationary engineer in the City of Nashville to neglect or refuse to comply with the orders and directions of the Boiler and Elevator Inspector given under the authority of the ordinances of the City, and that any violation thereof shall be deemed a misdemeanor, and such person shall, upon conviction thereof, be fined as provided in said Ordinance No. 759.

Board of Commissioners, Ord. 900. Approved Jan. 12, 1917.
Idem.

632. *Inspection of Boilers.*

1. All owners or users of any stationary boilers, or steam generating apparatus under pressure shall have the same inspected and tested as herein provided, before and while being used, and at least once a year thereafter; and for every neglect or refusal to have such inspection and test they shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined as herein provided.

2. On the written application of any owner or user of a steam boiler or boilers, or steam generating apparatus, duly countersigned by the boiler inspector of any steam boiler inspection and insurance company, which is authorized to transact business as herein provided,

3. It shall be the duty of the Inspector of Boilers and Elevators, upon the receipt of such application, to inspect the boiler or boilers of any such owner or user making such application, by the hammer test; and the Boiler Inspector shall, after performing the duty, give the said owner, or user a certificate of inspection as required by this ordinance and the said inspection and certificate shall be valid and accepted as in full compliance with the provisions of this ordinance.

4. In addition to the above, each steam boiler inspection and insurance company doing business under the provisions of this ordinance shall make a semi-annual report to the Inspector of Boilers and Elevators of all boilers inspected by the respective companies on the first day of January and July of each year, on blanks to be furnished by the Inspector of Boilers and Elevators, and such blanks shall contain the same requirements as those used by the Inspector.

5. If owners or users of steam boilers, or engineers in charge of the same, shall carry a greater pressure than is allowed in the certificate of inspection granted by the Inspector of Boilers and Elevators, they, or either of them, shall be deemed guilty of a misdemeanor and upon conviction thereof, shall be fined as herein provided and in the case of an engineer, his license shall be revoked.

6. Or if such owners or users shall use any boiler which has been condemned as unsafe by the Inspector of Boilers and Elevators, they shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined as herein provided.

Board of Commissioners, Ord. 759. Approved June 7, 1916.
Idem.

633. The Inspector of Boilers and Elevators shall promptly deliver to every owner or user of any boiler, certificates of inspection

of the boilers inspected by him or by his assistant; every such certificate of inspection shall be properly made up as herein provided, and signed by said Boiler Inspector.

2. Said certificate of inspection shall be displayed in some prominent place near where the boilers are used.

Idem.

634. *Exemptions.*—The engineers, engines and boilers of the Fire Department, and the locomotive boilers used on railroads, are exempt from the provisions of this ordinance.

Idem.

635. *Boiler Inspector's Certificate to be Posted.*

1. Any steam user failing to place or put in a conspicuous place in the engine room or boiler house, the Boiler Inspector's certificate shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined as herein provided.

2. Upon any owner or user of a boiler refusing to obtain a certificate of inspection as provided for in this ordinance, it shall then become the duty of the Inspector of Boilers and Elevators to at once draw the fire under the said boiler and not permit its further use until the said certificate is duly obtained as required in this ordinance.

Idem.

636. *Duties of Owners and Users of Boilers.*

Before any owner, owners or users of steam boiler or boilers shall have said boiler or boilers placed in position, he or they shall notify the Inspector of Boilers and Elevators, who shall examine the same, and satisfy himself that the construction, material, bracing and all other parts of the boiler or boilers are such as to assure the safety of the same. It shall also be the duty of the owner or user of any steam boiler that requires repairs to notify the Inspector of Boilers and Elevators, who shall satisfy himself that the repairs made will assure the safety of said boiler or boilers.

Idem.

637. Any violation of the provisions of this section shall be considered a misdemeanor, punishable by a fine as herein provided.

Idem.

638. *Code.*—The Code of the American Society of Mechanical Engineers is hereby adopted as a standard of rules and regulations for the manufacture and use of boilers within the City of Nashville, Tenn.

Idem.

639. *Boilers to Have Plugs.*

1. All boilers shall have inserted in them plugs of brass, filled with banca tin, a follows: All cylinder boilers with flues shall have one plug inserted in one flue of each boiler; and also one plug in the shell of each boiler, as follows:

2. All plugs in shells shall have an external diameter of not less than that of one-inch gas pipe screw tap, and an internal opening of not less than one-half inch in smallest opening, all plugs to be inserted in shell from inside, on second sheet from forward end, one inch above flues; all plugs to be inserted in flues not more than three feet from after end, all plugs to be inserted in flues to have an external diameter of that of a three-fourths gas pipe screw tap, and an internal opening of one-half inch except flues or tubes of six inches or less, when plugs may be used with an external diameter of that of three-eighths gas pipe screw tap, with an internal opening of one-fourth of an inch.

3. The Inspector of Boilers and Elevators shall have power to have one plug placed in each boiler not provided for in this ordinance, as he may deem necessary for the safety of lives and property and it shall be the duty of the inspector to see that such plugs are filled with banca tin at each inspection.

Idem.

640. *Furnace or Boiler Rooms.* No warm air furnace, or low pressure steam hot water-vapor or other heating plant shall be installed in a room with open joist ceilings above same, except such joist and ceiling is fireproofed, provided that such fireproofing may be left out if there be 24 inches or more of clearance above such furnace or boiler, and the smoke pipes thereof.

Idem.

641. *Warm Air Furnaces, Vapor Systems and Low Pressure Steam or Hot Water Heating Boilers.*

1. All furnaces (or) boilers of the above class shall be set on a secure incombustible foundation.

2. Clearance at sides and backs between furnace and combustible wall and (or) partition shall not be less than five feet and clearance at front not less than six feet.

3. Clearance above such boilers or furnaces shall not be less than two feet to combustible ceiling or to under side of ceiling joists unless an approved metal shield intervenes, when such clearance may be

not less than thirteen inches. An approved shield shall be constructed of not less than 24 B & S gauge galvanized iron securely riveted together and reinforced at all edges by suitable angle irons not less than 3/4x3/4inch; or similar strengthening if approved by the Inspector; this shield must be suspended three inches below the ceiling by lag screws or other approved metal hangers. The shield must project on all sides at least one foot beyond all outer sides and surface or furnace or boiler. *Provided* that where ceilings of metal lath and cement plaster are installed the above shield may be left off.

4. All furnace tops shall have rim extending at least two inches above the top of casing or other satisfactory receptacle, and such space within the rim shall be filled with sand.

Idem.

642. *Smoke Pipes and Protections.*—Smokepipe connecting the furnace with flue or chimney shall be made of not less than 22 B. & S. gauge galvanized iron and shall not be nearer than thirty inches to combustible ceiling or under side of joists at point of leaving furnace or boiler and not nearer than eighteen inches at point of entry into flue or chimney.

The distance in this section may each be reduced six inches when a metal shield extending one foot beyond the outer edge of the smokepipe on each side is constructed and installed as required for furnaces such shield to continuously extend from point where smokepipe leaves furnace or boiler to the chimney or flue.

Idem.

643. *Warm-air Pipes.*—All pipes for the conveyance of warm air shall be of bright tin or galvanized iron. The main leads of said pipes shall leave the furnace not less than 18 inches below the line of beams or ceilings, and have a gradual incline upward to not less than two inches of beams or ceiling at junction with the outlets to register boxes in floors or connections to wall pipes.

All main leader pipes and junctions, and the riser pipes in walls shall be covered with one thickness of asbestos covering.

All lath work for plaster on walls enclosing such pipes shall be expanded metal and contact with wood or other combustibles is prohibited in all classes of warm air pipes, but a space of at least 1/2 inch shall be maintained between same.

Idem.

644. *Hot-air Register.*

1. All hot-air registers hereafter placed in the floor of any building shall be set in iron borders not less than two inches in width.

2. There shall be an open space of at least one inch on all sides of the register box, extending from the under side of the ceiling below the register to the border of the floor.

3. The outside of said space where there is woodwork shall be covered with asbestos 1/8 inch made tight, and to extend from the under side of the ceiling up to the under side of said border.

4. The Boiler and Elevator Inspector shall not issue a permit for such installation, repairing or renewal of a warm air heating plant until he has carefully inspected the plans, specifications or description thereof and that the same are and are intended to comply with the ordinances relative thereto.

5. The Contractor shall notify the Inspector and inspections of new work shall be made as follows: When such work has proceeded to where the boiler or furnace has been set, and again when stacks to upper floors and heads for all registers have been installed, and boots have been connected and when the job is completed.

6. Upon finding that the works are lawfully constructed the Inspector shall affix to the boiler or furnace and to each stack or register head, a certificate stating that the work complies with the ordinances relating thereto.

7. Inspection of repaired or renewed work shall be made, in each case, as the nature of the work shall require.

8. Final inspection of plant shall be made after the whole is connected up and ready to operate, but before any fire has been started.

9. It shall be unlawful for any person to lath over, plaster or cover up any warm air heating work installed in any newly constructed building before such work has been inspected and certificates above referred to have been attached.

10. The Boiler and Elevator Inspector or his assistant shall have the right and authority to condemn any works or order removed all such lath, plaster or other covering which have been placed over such work of an unlawful nature by the plasterer or any other person whatsoever.

11. The person, firm or corporation ordering or causing such work to be covered up as herein set forth, shall, upon conviction be subject to the penalties set forth for violations of the terms of this ordinance.

12. No heating permits shall be required for minor repair work. (By minor work is meant for incidental repairs to furnaces, which shall not affect the general action of the system, such as renewal of grates, smoke pipes, etc.,) but where stacks are renewed or installed, or where additional registers are installed, or where other work is done that would require inspection under the terms of this section, a permit shall be required and taken out.

Idem.

645. *Elevators.*

1. All elevators installed or altered on or after approval of this ordinance shall conform with these regulations, except that in cases where contracts for the installation of new elevators, or the alteration of existing elevators, have been made prior thereto, the same may be made to conform to the regulations now in force, *provided,* however, that notice of such contracts made prior to approval of this ordinance shall be sent to the Boiler and Elevator Inspector before that date.

2. It shall be the duty of the Inspector of Boilers and Elevators to regularly inspect all elevators used for the purpose of carrying passengers or freight semi-annually. The result of such inspection shall be properly recorded in books kept for that purpose in the office of the Inspector of Boilers and Elevators, from which place all notices, certificates, etc., shall be issued.

(a) Working plans and specifications for all layouts for elevators and other appliances covered by this ordinance must be submitted to the Boiler and Elevator Inspector's office for approval in advance of any work being done in connection with the building of same. These plans should accompany applications for permit.

(b) Any installation must not be turned over for operation for service until final certificate of approval has been issued by the Boiler and Elevator Inspector.

(c) No departure from approved plans shall be made in installing elevators or other appliances covered by this ordinance, nor shall any change be made in existing installations, without consent of the Boiler and Elevator Inspector.

(d) Nothing in this section shall prevent any owner or his agent from making the ordinary repairs for maintenance, or prevent him from making repairs at once when needed.

3. *Hatchways.*—On all future installations the hatchways shall be so constructed that the inside surface which comes in front of the

opening, or door of the car, shall be flush. Where projecting thresholds are used, they shall be beveled sufficiently on their under side. Nothing in this section shall apply to the hatchways of elevators located in manufacturing plants, warehouses, or stores, which are used for the transportation of freight, provided same are protected by automatic hatchway doors.

4. *Overhead Supports, Elevator Guides, Etc.*—All guides for passenger elevators must be of steel. All supports for overhead sheaves or machines for passenger elevators must be of steel, and the same must be supported by steel or masonry work from the base of the building. The same requirements for guides and overhead supports apply to all freight elevators with a car platform area of more than sixteen square feet where same are operated by steam, hydraulic or electric power. Steel guides for cars with platform area of less than sixteen square feet may be built of lighter material than that required for passenger service, but shall be subject to the approval of the Boiler and Elevator Inspector, or may have wood guides not less than 2x2¼, end match, put in with lag screws or bolts, and wooden guide posts for the counterbalance as well as for the car. Wooden counterweight boxes will not be permitted.

5. *Overhead and Pit Clearance.*

(a) On all electric elevators a clear space of not less than 3 feet must be provided between the top of the car cross-head and the lowest point of the overhead work, and a depth of pit not less than three feet below the lowermost car landing.

(b) All passenger elevators shall be provided with cushion spring bumpers of type approved by the Boiler and Elevator Inspector, at least 12 inches in height, resting on a steel frame work secured to the guides, or in the pit forming the bottom of the shaft, the car frame being arranged with steel striking plates to meet the bumpers. On elevators of the traction type, these bumpers are to be of the oil type with spring return, the stroke of the bumper plunger to be not less than 12 inches

6. *Overhead Protection.*—All hatchways shall be protected at the top, above the clearance line and under the overhead mechanism, with a screen or (floor) of sufficient strength to bear a weight of not less than fifty pounds per square foot, and constructed so as to prevent anything dropping down the hatchway.

7. *Passenger Elevator Enclosures.*—All passenger elevators shall be protected on the front the full width of the door in the car from

the floor to the ceiling on each floor, excepting the top landing where the height of the front shall be not less than seven feet and six inches. On all sides excepting the front, the enclosure shall extend to a height of not less than seven feet and six inches above the floor.

Where enclosure is of grille work, no greater space than one and one-half inches square shall be permitted; or if rods are used, they shall be vertical, and spaces between sides of rods shall not exceed one and one-half inches.

8. *Hatchway Doors to Passenger Elevators.*—All hatchway doors to passenger elevators shall be hung on substantial hangers of approved type. Doors shall be properly guided at the bottom and fitted with substantial locks so that they cannot be opened from the landing side except by means of a key. This does not apply to elevator equipped with automatic door-closing devices of type approved by the Boiler and Elevator Inspector.

9. *Counterweight Protection.*—Where the counterweights of an elevator travel on an exposed side of the hatchway, they shall be protected the full height of their travel by a solid screen or metal, or by wire mesh with openings not greater than one-half inch square. No counterweights shall be located so that they will pass an entrance to any hatchway.

10. *Passenger Elevator Cars.*

(a) Passenger elevator cars shall be built of fireproof material throughout, with the exception of the flooring, and this must be completely covered with metal on its under side. When the cage is constructed of other than solid material, and where the counterweights pass the car at a distance of less than two feet, the side of the car next to counterweights shall be solid or be protected by a screen of fine mesh wire, the openings of which shall be not greater than one-half inch square. Where cars are not constructed of solid material, the grille work shall conform to the specifications covering hatchway enclosures, as set forth in paragraph 7.

(b) All elevator cars traveling in single enclosed hatchways shall have an emergency exit in the top of canopy arranged so that it may be removed to provide an exit for passengers should the car become lodged between landings. Where cars travel in adjoining hatchways, they shall be provided with emergency exits at the sides adjacent to each other so as to provide for the transfer of passengers from one car to the other.

(c) Every passenger elevator with more than one entrance to an exit from a car shall be provided with a sliding door on the inside of the car on each such entrance or exit, and each of such doors shall be securely closed before the elevator is put in motion.

11. *Freight Elevator Cars.*

Freight elevator cars shall be protected on all sides not used as entrances with metal enclosures not less than five feet above floor of car. On long cars, such as are used in garages, a substantial railing not less than three feet above floor of car may be used in place of enclosure, but a solid enclosure the full width of the counterweights and not less than six feet in height must be used where counterweights pass car.

(a) The opening in the hatchways of freight elevators shall be protected by semi-automatic gates extending to a height of not less than four feet above the floor. This does not include hatchways with doors of approved type and design where the cars in such hatchways are in charge of an operator.

12. *Floor Locks.*—All freight elevators shall be provided with a locking device by means of which persons using the elevator at any floor can lock the operating cable and prevent the starting of the elevator by persons on another floor.

13. *Warning Chains on Freight Cars.*—Warning chains shall be suspended from the car sills of power freight elevator cars, except those of dumbwaiters, hatchway type elevators and sidewalk type elevators and except those with landing doors opening from the shaftway.

14. Every passenger and freight elevator car when in use shall be properly lighted by electricity or gas at such times as there is insufficient natural light. The lights may be located in or adjacent to the shaftway if the car is lighted properly throughout its entire travel, or the light may be located in the car.

15. *Windows in Hatchways.*—Shall not be considered under the head of openings. All such windows shall contain wire glass in fireproof frames and sash, and shall be painted red to indicate to firemen that they are in an elevator shaft.

16. *Hoisting Cables.*—Wire cables shall be used for the hoisting, counterweighting and operating of all elevators. The diameter of these cables shall be such as to give a factor of safety of not less than seven to one on all passenger elevators, and not less than five to one on all freight elevators, where cables are used for hoisting or for

counterweights. Where cable is used for operating, such cable shall be of what is known as tiller rope, and shall be not less than three-eights of an inch in diameter. All elevators with cables winding around drums, shall have not less than two hoisting cables. Where a drum-counterweight alone is used, this shall have two cables. Where a drum and car counterweight is used, each counterweight shall have two cables, and the drum weight must be connected separately from the car counterweights and below them.

(a) Where the drum weight cables pass the car counterweights, they must be protected by iron pipe, or the car counterweight must be cast so as not to chafe drum weight cables.

(b) Where necessary, all cables shall have suitable equalizers for distributing the load, the ends of all cables to be independently fastened in suitable sockets, the wires of the cables to be looped and babbitted into sockets so that the fold of the loop shall show through the babbitt. Where cables are secured to the elevator drum, they shall pass through separate holes in surface of drum and be secured on the inside of drum with suitable locking clamps. Where cables are wound on drum, not less than one and one-half complete turns of each cable shall be permitted on drum. On traction machines, the total number of cables for hoist and counterweights shall be not less than four. On hydraulic elevators, with the exception of elevators of the plunger type, there shall be not less than two hoisting cables and two counterweight cables. Bar equalizers for car and counterbalance for traction elevators are not required; but adjustable shackles which readily admit of adjustment of cables are to be provided. The diameter of sheaves and drums over which the hoisting or counterweight cables pass, shall be not less than twenty-four inches.

17. *Clearance Between Car and Entrance Landing.*—The space between the edge of the car platform and the threshold of any landing shall be not greater than one and one-half inches.

18. *Safety Devices on Cars.*

(a) The safety devices on all passenger elevators where the speed is over seventy-five feet per minute, shall be mounted on independent steel frames or girdles which shall be entirely independent from the car floor or enclosing cab.

(b) The safety clutches shall be located under the car platform and attached to the frames or girdles, the safety device to be operated by means of a speed governor which shall bring the safety clutches into action when the car attains an excessive descending speed,

whether due to the breakage of the cables or any other cause. The action of the governor and safety clutches shall bring the car to an easy and gradual stop in a distance not to exceed eight feet from the time the safety is applied until the car reaches a full stop.

(c) No elevator shall be used for carrying of safes or other material of a greater weight than the normal lifting power of such elevator unless the car is equipped with a locking device which shall hold it fixed at any landing independent of the rope while such safe or other material is being loaded or unloaded. The normal carrying capacity of all passenger elevators shall not exceed seventy-five pounds per square foot inside area of platform.

19. *Safety Appliances for Elevators Other than Above.*—All electric elevators having a car speed of seventy-five feet or over, shall be equipped with the following safety appliances, which are in addition to those specified in paragraph 15: The brakes of all electric elevators, as above specified, shall be electrically released during the operation of the elevator, and brakes shall be applied by spring pressure when the current is cut off either by the operator or through any other cause. The construction of these brakes shall be so that the magnet or solenoid operating same shall be directly attached to the brake levers and shall not be transmitted through means of shafts, gears or other mechanical devices.

20. *Terminal Stops for Electric Elevators.*—The terminal stops of electric elevators shall be controlled both by an automatic stop motion device mounted on the machine (excepting push-button and traction elevators) and by substantial limit switches located in the hatchway. These limit switches shall be so arranged as to be actuated by the car itself, should it pass the upper or lower terminals of its travel. The operation of the machine and hatchway limits shall apply the brake and bring the car to rest independent of the operator.

21. *Operating and Emergency Switches.*—The operating switch in car shall automatically return to a stop position should the operator for any cause release his hold on same, and there shall be in each electrically controlled elevator car an emergency switch located close to the operating switch by which the operator can cut off current and bring the car to a stop should the main operating switch fail from any cause.

22. Every electrically controlled elevator shall be provided at the engine with a potential switch which shall automatically cut off the current, should the voltage drop below twenty-five per cent, of the

required voltage, or should the current supply for any cause be interrupted. All electric elevators running at a car speed of 350 feet or over, shall have a switch on the speed governor, so that when the governor operates to stop the car the switch shall operate to cut off the current supply.

23. *Slack-cable Device.*—All hoisting engines of the drum type shall have an automatic slack-cable device which shall stop the machine if the hoist or drum weight cables should become slack from any cause.

24. *Controlling Mechanism of Elevators.*—No elevator which runs at a car speed greater than one hundred and twenty-five feet per minute shall be controlled by a hand shipper rope, and no elevator which runs at a car speed of over one hundred and fifty feet shall be controlled by a wheel or other mechanical device. This does not apply to hydraulic elevators equipped with what is commonly known as the lever control. All electric elevators running at a car speed of more than one hundred and fifty feet per minute shall be controlled by means of an operator's switch in the car.

25. All elevators of the direct plunger type shall be exempt from the specifications of paragraph 16.

26. The hatchways of all hand power elevators and dumbwaiters which have a travel of more than two stories shall be of fireproof construction and provided with suitable doors and gates. The same shall have a pit depth and overhead clearance of not less than twelve inches at each terminal. Where elevators mentioned in this Section are used for stage lifts, the hatchways may be protected at the landing with guard rails and suitable gates at the entrances.

27. *Inspection of Elevators in Regular Service.*—Owners of all elevators in regular service shall have them inspected at least once each week by a competent person. Where such inspection shows any elevator defective, such elevator shall not be used for service until proper repairs have been made and report of same made to the Boiler and Elevator Inspector's office.

28. *Elevator Installation Prior to Passage of this Ordinance.*—The foregoing provisions of this ordinance shall not apply to elevators installed prior to the date of its passage where said elevators are insured and inspected by a reputable casualty, liability or surety company licensed to do business in the State of Tennessee, or where they are inspected as prescribed in paragraph 24. Any subsequent and material changes or alterations in existing elevator installations

shall conform as far as practicable to the requirements of this ordinance.

29. No signs of any description shall be placed in the car, with the exception of the annunciator or operator's signal, and no glass or porcelain shall be attached to the dome of the car, with the exception of the light fixtures.

30. No person under the age of eighteen years shall operate, control, manage or be in charge of any elevator. No person, firm or corporation shall employ a person under the age of eighteen years to operate, control, manage or have charge of any passenger elevator in the City of Nashville.

31. Any person operating, controlling, managing or in charge of any passenger elevator, when the door has been opened for the reception of passengers, shall not start such elevator either up or down until the door of same has been closed and fastened, except such doors as are equipped with automatic operating devices, and when so equipped, such cars may be started when doors are within not more than six inches of being closed and in the act of closing.

32. No person operating, managing or in charge of any passenger elevator shall open the door of same for the purpose of discharging passengers therefrom until such elevator has been brought to full stop and be standing still.

Idem.

PART LI.

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646. *Duty of City Officers.*

1. The enforcement of this ordinance and all other laws and ordinances in force in the City applicable to the same subject matter shall primarily devolve upon the Building Inspection Department, the Electrical Inspector, and the Boiler and Elevator Inspector.

2. But the Department of Health, Fire and Police shall also be charged with the enforcement of this ordinance, and shall, as far as possible, act in connection with the Building Inspection Department.

3. But nothing herein shall be construed as to exempt any other officer or department from the obligation of enforcing the provisions of this ordinance.

Idem.

647. This ordinance is intended to be a complete system of the building laws for the City of Nashville, however, it does not and is not intended to include the ordinances regulating plumbing and smoke prevention.

Idem.

648. That the invalidity of any section, clause, or part shall not render the remainder of this ordinance invalid.

Idem.

PART LII.

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649. *Fines and Penalties.*—Any person, firm or corporation who neglects, or refuses to comply with any of the provisions of this ordinance shall be deemed guilty of a misdemeanor and upon conviction therefor shall be fined not less than five ($5.00) dollars, nor more than fifty ($50.00) dollars. And the continued violation of any provision of this ordinance shall constitute a separate offense, for each and every day such violation of any provision hereof shall continue.

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